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THE IMPACT OF STUDENTS WITH SPECIAL EDUCATION NEEDS IN THE GENERAL EDUCATION SETTING ON MISSOURI'S STATE ASSESSMENT

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ABSTRACT

Schools and educators have been increasingly educating students with disabilities in the general education setting; while at the same time the level of accountability for making a positive outcome on high stakes assessments for all students has increased. As educators feel pressure for their students to perform well on state assessments and meet the Annual Yearly Progress (AYP) benchmark, there will be questions around which settings are most effective in meeting the academic needs of students with disabilities. With the trend in Missouri towards a greater level of participation in the general education setting for students with disabilities, this study has added to the understanding of the relationship between the setting and the impact on high stakes state assessments.

This study began with utilizing the data from 1250 elementary schools from all 524 districts in the state of Missouri over a three-year period (i.e. 2008, 2009, and 2010). Data for this study were obtained from Missouri's Department of Elementary and Secondary Education (DESE) from three different sources of public information: Missouri State Performance Plan (SPP) data, School Accountability Report Card data, and the Annual Performance Report (APR).

This study examined the impact of the percentage of time students with IEPs participated in the general education setting had on the Missouri's Assessment Program's (MAP) Communication Art and Mathematics assessments for student with and without disabilities. The study considered the influence of other factors reported to have an impact on student achievement such as student to classroom teacher ratio, a district's expenditures per ADA, the percentage of FRL, and the ratio of students identified with disabilities within each school.

A Pearson correlation was used to determine the stepwise order for the covariates. A stepwise multiple linear regression was then used to determine the statistical significance of the independent variables and covariates for each of the three years of this study (2008, 2009, and 2010). Finally, a one-way ANOVA was utilized to analyze the differences between the means on the dependent variable.

The results of the study showed the time students with disabilities spent in the general education setting had a statistically significant impact on the MAP assessment results. However, the overall impact is quite small in a practical sense. Additionally, there was evidence within this study that the covariates were highly correlated to the setting variable and had a larger impact on the MAP results. This study also showed the time students with disabilities spend in general education does not have a negative impact for students with or without disabilities in regards to the MAP assessment. When schools had high levels of participation with high amounts of time spent in general education, the schools had increased scores on both the Communication Arts and the Mathematics assessment for both students with and without disabilities.

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CHAPTER I

INTRODUCTION

Educators in the United States have historically struggled with how to best meet the instructional needs of students with disabilities. To assist in meeting the needs of students with disabilities, educators have strove to better understand the environmental factors and the instructional methods that best meet the needs of the students with disabilities. Theoretical understanding, new approaches to treatment, and advances in technology have made it possible for improvements in the ability of educators to meet the needs of students with disabilities (Mallory & New, 1994). In addition to these changes, the voices of families and advocates have encouraged educators and society in general, to shift towards becoming more inclusive towards students with disabilities. Students with disabilities are now more than ever being educated alongside their nondisabled peers. This shift towards inclusivity has occurred despite reservations, criticisms, and legal actions in an attempt to prevent students with disabilities being educated in the same settings as their nondisabled peers.

Contrary to the beliefs that have driven these challenges, there is an underlying belief in the United States that there is value in educating all members of the society. Additionally, there has been a long standing belief in the power and importance of public education in the United States. In a letter to Dr. Benjamin Rush, John Jay, First Chief Justice of the United States wrote in 1785:

> I consider knowledge to be the soul of a Republic, and as the weak and the wicked are generally in alliance, as much care should be taken to diminish the

> number of the former as of the latter. Education is the way to do this, and nothing should be left undone to afford all ranks of people the means of obtaining a proper degree of it at a cheap and easy rate (Johnston, 1891, p. 139).

The history of the United States is full of those that have supported the strength and the power of education and the role of the government in ensuring the citizens are educated. For example, Horace Mann stated, "…all the people of the State should be educated by the State" (Mann, 1847, p. 58). As a result of these beliefs in education, the United States was the first country to have free elementary schools for its citizens (Bethel, 2008).

However, when the forefathers of this country made statements like "all people" or "all citizens" it has not always been so clear they really meant all. In fact, they often did not really mean all. The emphasis on "all citizens" receiving an education and knowledge in the United States has often been rhetorical. As a result, the public has struggled with understanding and believing that "all" truly can mean "all." The process of clarifying the fact that education can and should be for all members of the society has been a drawn-out one; a process that, in part, took hold with the civil rights movement and racial segregation. In much the same experience as minority students went through; students with disabilities were not educated or if they were educated it was done in separate schools away from students without disabilities. Prior to students with disabilities having the right to participate fully in public education, there were several landmark cases and legislation that more clearly defined public education for all. These court cases and legislation, which will be described in more detail in Chapter 2, started to remove the legal and social barriers that prevented some citizens of the United States from being educated.

Trends

As a result of court cases, legislation, and overall changes in the socio-cultural belief systems, school districts have been increasingly serving students with disabilities in the general education setting. The U.S. Department of Education, National Center for Education Statistics (2010) has collected national data which indicates a slow yet consistent trend towards students with disabilities being served increasingly in the general education setting. This trend can be seen in Table 1. The national data reported in Table 1 has three different ranges of participation in the general education setting. A student may spend 80% or more of the time in the general education setting, 79- 40% of the time in the general education setting, or 39% or less of the time in the general education setting (i.e. if a student spends 75% of the time in a general education setting, they spend 25% of the time in a special education setting). There are additional environments in which a student may be educated outside of these three ranges. These additional environments are considered as separate settings such as Separate Public School, Separate Private School, Homebound/Hospital, and Correctional Facilities and they make up a very small percentage of placements.

In the national data there has been a steady increase in the percentage of students with disabilities educated in the general education setting at least 80% of the time or more. While at the same time, the percentage of school age students with disabilities being served in the general education setting in the 79-40% and the 39% or less of the time has decreased. This means students with disabilities are spending more time in the general education setting than they did just a few years ago.

Table 1

National Percentage Distribution of Students Ages 6-21 served under IDEA

Placement in General Education Setting	80% or more	79-40%	39% or less
1989-90	31.7	37.5	24.9
1990-91	33.1	36.4	25.0
1994-95	44.8	28.5	22.4
1995-96	45.7	28.5	21.5
1996-97	46.1	28.3	21.4
1997-98	46.8	28.8	20.4
1998-99	46.0	29.9	20.0
1999-00	45.9	29.8	20.3
2000-01	46.5	29.8	19.5
2001-02	48.2	28.5	19.2
2002-03	48.2	28.7	19.0
2003-04	49.9	27.7	18.5
2004-05	51.9	26.5	17.6
2005-06	54.2	25.1	16.7
2006-07	53.7	23.7	17.6

Source: U.S. Department of Education, National Center for Education Statistics, *The Condition of Education (2010).*

In the state of Missouri, over the past four years a similar trend can be seen in Table 2. There has been an increase in the percentages of school age students with disabilities being served in the general education setting 80% of the time or more. At the

same time, the percentage of school age students with disabilities being served in the general education setting in the 79-40% and the 39% or less of the time has decreased.

Table 2

Missouri Percentage Distribution of Students Ages 6-21 served under IDEA

Placement in General Education	80% or more	79-40%	39% or less
2006-2007	57.23	26.58	10.51
2007-2008	58.39	25.89	9.99
2008-2009	59.28	25.26	9.81
2009-2010	59.77	25.12	9.56

Source: Missouri Department of Elementary and Secondary Education

In the state of Missouri, special education placement is directed by the Missouri State Plan. The Missouri State Plan directs schools to "ensure that to the maximum extent appropriate, children with disabilities… are educated with children who are nondisabled" (Missouri Department of Elementary and Secondary Education, 2010).

In Missouri, students with disabilities may be identified with one or more of 14 different disabilities: Intellectual Disability, Emotional Disturbance, Speech Impairment, Language Impairment, Orthopedic Impairment, Visual Impairment, Hearing Impairment/Deafness, Specific Learning Disability, Other Health Impairment, Deaf/Blind, Multiple Disabilities, Autism, Traumatic Brain Injury and Young Child with a Developmental Disability (YCDD). These disabilities may impact a student's educational performance in different ways, including physically, mentally, behaviorally, or psychologically.

The reauthorization of the Individuals with Disabilities Education Act (IDEA, 2004) is the federal legislation that drives special education practices and is advancing the trend towards students with disabilities being educated at higher rates in the general education setting. IDEA has accomplished this; in part, by mandating the Least Restrictive Environment (LRE). The LRE is the setting in which students with disabilities are to be educated with nondisabled peers to the greatest extent that is appropriate. Typically, this is viewed as the general education setting. Additionally, as part of the accountability requirements, the federal No Child Left Behind (NCLB) act of 2001 requires students to have access and participation within the core curriculum or general education setting (Giometti-May, 2009). Together IDEA and NCLB have been driving forces that have, in part, increased the rates of students with disabilities being educated in the general education setting both in Missouri and nationally. While at the same time, these two legislative acts have also increased the assessment demands for educators.

Assessment

States, districts, schools, and educators are responsible for the academic progress of all students, including students with disabilities. IDEA includes legislation that requires educators to assess the academic progress of students with disabilities. These requirements are the same as they are for students without disabilities as mandated by NCLB. Both the IDEA and NCLB legislative acts require schools to assess all students and makes schools accountable for the outcomes of all students. In Sec. 300.160 (Participation in Assessments), IDEA requires that, "A State must ensure that all children with disabilities are included in all general State and district-wide assessment

programs…" As a result of IDEA and the requirements for the LRE and assessment, educators are increasingly attempting to find more effective ways to educate students with disabilities in the general education setting while having increasingly higher expectations for positive outcomes on the required state assessments. As educators continue to feel the need for their students to perform better on state assessments and meet the Annual Yearly Progress (AYP) benchmark, there will continue to be questions around which settings are most effective in meeting the instructional needs of students with disabilities.

AYP is the measurement of how well a district performs on the state assessment. In the case of Missouri, the state assessment is called the Missouri Assessment Program or MAP. AYP data is a report on the percentage of students in a school in a specific group or subgroup that scored Advanced or Proficient on the MAP assessment. Simply put, Advanced and Proficient are scores that meet the requirements of NCLB while scores of Basic or Below Basic are considered as not meeting the requirements of NCLB. The data is disaggregated into groups including a subgroup for students with disabilities, which is reported as an Individual Education Plan or IEP subgroup. Additionally, the AYP results for the total population in each district are reported. In a time of high stakes testing and accountability, it should be noted that districts are struggling with the accountability requirements of NCLB and the legal requirements of the IDEA (Giometti-May, 2009).

Purpose of the Study

There are significant factors, including the aforementioned legislative acts (i.e. NCLB and IDEA), that are requiring educators to increase the participation of students

with disabilities in the general education setting while at the same time there is increasing tension to increase academic outcomes on state assessments. There is little understanding about how increasing the participation of students with disabilities in the general education setting impacts the results on the state assessments for students with disabilities and their nondisabled peers. The primary purpose of this study is to understand the relationship between the setting in which students with disabilities are educated and the impact on Missouri's state assessment for students with and without disabilities.

Past research, which will be described in more detail in Chapter 2, indicates increases in general education participation for students with disabilities will have a positive impact on academic outcomes for students with disabilities while having a mild positive to neutral impact on the students without disabilities. Based on this understanding this study will consider the following research questions.

Research Questions

1. What is the impact on Missouri Assessment Program's Communication Arts assessment for students with and without disabilities based on the amount of time students with disabilities spend in general education classrooms?

   Null Hypothesis: There is no impact on Missouri Assessment Program's Communication Arts assessment for students with disabilities and without disabilities based on the amount of time students with disabilities spend in general education classrooms.

2. What is the impact on Missouri Assessment Program's Mathematics assessment for students with and without disabilities based on the amount of time students with disabilities spend in general education classrooms?

Null Hypothesis: There is no impact on Missouri Assessment Program's Mathematics assessment for students with disabilities and without disabilities based on the amount of time students with disabilities spend in general education classrooms.

3. Does a change in the amount of time students with disabilities spend in general education across a three-year period impact scores on Missouri Assessment Program's Mathematics and Communication Arts assessment for students with and without disabilities?

   Null Hypothesis: There is no impact on Missouri Assessment Program's Mathematics and Communication Arts assessment for students with and without disabilities based on changes in the amount of time students with disabilities spend in general education across a three-year period.

Delimitations

For the purpose of this study, only grades 3-5 were included due to the limited grade levels the Missouri Assessment Program (MAP) assesses and for consistency in the data. At the lower grades, kindergarten through second grade, there is no state assessment. Grade levels above 5th grade may not be consistently comparable because of different models at the secondary level including middle schools, junior high schools, and high schools that have grades 6-12. Public separate schools were also removed from the analysis since their population does not include students without disabilities and there is no general education setting. Additionally, schools that do not have an IEP subgroup as a result of small numbers of kids with disabilities in the school were removed. As a result of confidentiality laws, the unit of analysis was at the school level and not at the individual student level.

Definition of Terms

Annual Yearly Progress or AYP is the yearly benchmark set by the government that schools are to meet each year in order to show progress towards the 2014 goal.

Education of All Handicapped Children Act (PL 94-142) of 1975 was legislation that mandated that all children had the right to a free and appropriate public education in the least restrictive environment.

Elementary and Secondary Education Act of 1965 or ESEA was legislation that removed barriers for students with disabilities by providing funding to states for the education of students with disabilities.

Free Appropriate Public Education (FAPE) is a standard of education that is freely provided to students with disabilities as required by IDEA.

General Education Setting is the setting in which students without disabilities are educated.

Individuals with Disabilities Education Act or IDEA (1990, 1997, 2004): is the legislation that delineates the rights for children with disabilities including FAPE and LRE.

IEP or Individual Education Plan is a written plan the school team and parents use to guide the educational programming of a student with a disability.

Least Restrictive Environment is the setting in which students with disabilities are to be educated with nondisabled peers to the greatest extent that is appropriate.

Missouri Assessment Program or MAP is the annual assessment given to students in Missouri to meet the requirements of NCLB.

No Child Left Behind or NCLB is the reauthorization of the Elementary and Secondary Act.

Public Separate School is a public school with a student population consisting of only students with disabilities.

Special Education Setting is the setting in which students with disabilities may be educated apart from the nondisabled peers in order to meet specific needs.

Student with a Disability is a student that has been identified as meeting the criteria in the state of Missouri in 1 of 14 different disabilities categories.

Significance of the Study

Over the years, educators have been changing how they educate students with disabilities, while at the same time the level of accountability for making a positive outcome for all students has increased. As educators continue to feel the need for their students to perform better on state assessments and meet the Annual Yearly Progress (AYP) benchmark, there will continue to be questions around which settings are most effective in meeting the instructional needs of students with disabilities. With the trend in Missouri towards a greater level of participation in the general education setting for students with disabilities, there will be a greater need for understanding on the part of educators on how this trend impacts their ability to educate all of their students and their students' results on the state assessments. This study will add to the knowledge educators can use to better understand the relationship between the setting and the impact on the state assessment.

CHAPTER II

LITERATURE REVIEW

This review of literature describes the historical path of increasing levels of participation in the general education setting for students with disabilities, the impact of the educational setting has on students with and without disabilities on measures of achievement, the current accountability components of NCLB and IDEA, and other variables that impact achievement. With greater expectations for high levels of performance being placed on educators and students, including those with disabilities, educators need to know more about how the educational setting for students with disabilities impact high stakes state assessments for students with and without disabilities.

Historical Background

Initially, students with significant disabilities were not given educational opportunities or services. In colonial America, people with disabilities were often handled with harsh treatments, which included being stigmatized, removed from public eyes, and in some case cruel measures like shackling or solitary confinement were used. Many families would isolate a family member with a disability, either to protect them or just to keep them hidden. In the mid-1700s, hospitals began to open to accommodate individuals deemed as being disturbed (Osgood, 2005). However, not until the early 1800s, did facilities begin to emerge that served students with disabilities (Thompkins & Deloney, 1995). The first school opened in 1817 in Connecticut for people who were deaf; a school for students with blindness opened in 1832 in Massachusetts, and the first school in the Western Hemisphere for students with mental retardation was founded in 1848 in Boston (Osgood, 2005). As education started to become compulsory in the

United States, students with disabilities were often educated in separate residential schools, state-run asylums, or in many cases they were not educated at all.

In the early 1900s, special segregated schools began to educate students with disabilities and by the 1930s most cities had segregated programs for students with a variety of disabilities (Osgood, 2005). A summary of how society viewed the students at the time can be seen in the book, *The Education of Handicapped Children*, written by J. E. Wallace Wallin in 1924. Wallin, a clinical psychologist and special education advocate, supported the segregation of students with disabilities by maintaining the students were "an unassimilable [sic] accumulation of human clinkers, ballast driftwood, or derelicts which seriously retards the rate of progress of the entire class and which often constitutes a positive irritant to the teacher and other pupils" (Wallin, 1924, p. 92).

In the 1940s and 1950s, there was a statistically significant increase in the number of students being identified as needing special schools as a result of greater awareness of disabilities and a greater desire by the public to educate students with disabilities. With a 47% increase in students enrolled in special schools, an increase of 83% in the number of districts providing services, and a 48% increase in the number of teachers in special programs; the discussion began to occur within education around whether separate settings were the most effective method for providing services (Osgood, 2005). Additionally, in the 1950s and 1960s, the courts and legislatures began to hear demands from parents for changes in how their children were being educated. The parents saw their fight to have their children with disabilities educated in the local school analogous to the civil rights fight occurring over racial segregation and in fact, any segregated environment was being considered as problematic (Bookhart, 1999). As a result, the

history of education for students with disabilities follows a similar path as the one for civil rights.

Civil Cases and Legislation

One pivotal landmark civil rights case and in turn a case for students with disabilities was *Brown v. Board of Education of Topeka, Kansas* (1954). In the case, the United States Supreme Court reversed previous decisions and determined that separate but equal was inherently unequal. The court determined that segregation based on racial discrimination was unconstitutional. Until *Brown v. Board of Education*, previous cases, such as *Plessy v. Ferguson* (1896) had supported the doctrine of separate but equal. Although, dealing specifically with racial segregation, *Brown v. Board of Education* also laid the foundation for addressing segregation based on disability. However, despite the desegregation foundation being laid by *Brown v. Board of Education*, twenty years would pass before further litigation would specifically address issues around students with disabilities.

As parents and advocates continued to lobby for changes at the federal level, several laws and acts were passed, which supported special education. In 1958, Public Law 85-905 which supported close captioning for films, Public Law 85-926 which provided federal support for training of teachers of children with mental retardation, and the National Defense Education Act of 1958, which provided additional support for the education of children with disabilities all passed, beginning the legislative movement to support students with disabilities. In 1965, the Elementary and Secondary Education Act (ESEA) started to remove additional barriers for students with disabilities by providing funding to states for the education of students with disabilities

In an effort to begin to challenge the thinking of educators, one of the more pivotal articles in the area of special education was written by Lloyd Dunn in 1968. The paper titled "*Special Education for the Mildly Retarded- Is Much of It Justifiable*?" was published in the journal *Exceptional Children*. In the paper, Dunn questioned the efficacy of the separate and segregated classes serving students with disabilities. Dunn questioned the ethics of the practice by stressing, that in his view, the past and present practices were morally and educationally wrong (Dunn, 1968). Dunn's paper jump-started the dialogue in the educational circles around the educational practices for students with disabilities.

In two additional landmark court cases, *Pennsylvania Association for Retarded Citizens (PARC) v. Pennsylvania* (1971) and *Mills v. Washington, D. C. Board of Education* (1972), the courts finally declared public education was for all students including those with disabilities. In *PARC v. Pennsylvania*, the case was a class action suit for fourteen students who had been identified as students with mental retardation. The students' families fought to receive a free and appropriate public education. At the time, Pennsylvania had laws that allowed schools to disregard responsibility for educating students considered as uneducable. As a result of the case, the state of Pennsylvania was required to take responsibility for the education of the students. In *Mills v. Washington, D. C. Board of Education*, the case was also a class action suit for seven students with various disabilities. The result in this case was that the District of Columbia school district was found to be responsible for educating all students regardless of the severity of the disability and regardless of the cost to the district.

In part, as a result of these two cases, Congress continued to pass legislation to increase the protection and rights of students with disabilities. In 1973, Congress passed Section 504 of the Rehabilitation Act, protecting the civil rights of all people with disabilities, including students in schools. Employers who received federal money were required to hire people with disabilities if the person could complete the essential functions of the job's responsibilities with appropriate accommodations in place. In the school setting, students could not be discriminated against and schools needed to provide appropriate accommodations for the students to participate in the educational setting.

The next pivotal and influential federal legislation that protected the rights of children with disabilities was passed in 1975; the Education of All Handicapped Children Act (Public Law 94-142). This legislation mandated Free Appropriate Public Education (FAPE) in the Least Restrictive Environment (LRE) for students with disabilities. Although the legislation never defined the LRE, there was an understanding that LRE implied a more integrated approach for students with disabilities. The legislation pushed educators to rethink how they had been providing services and to be more receptive of students with disabilities in the general education classroom.

Additionally, advocating for a change in practice towards a more inclusive setting for students with disabilities was seen coming from high levels of the government. In 1986, Madeleine Will, the Assistant Secretary for the Office of Special Education and Rehabilitative Services reported on the status of special education in an article titled *Educating students with learning problems- a shared responsibility*. Will proposed a system where special education and general education were one system and students with mild to moderate disabilities would be educated in the general education setting (Will,

1986). Will was concerned about the negative impact of pull out programs and the segregation of students with disabilities. She believed that good teaching was simply good teaching and all students should be able to be served in the general education setting without reference to disability labels (Kavale & Forness, 2000).

Through continued civil cases, the courts declared that the general education setting was a "right" and not just a privilege for students with disabilities (*Oberti v. Board of Education of Clementon School District (1993); Roncker v. Walter (1983); Daniel R.R. v. State Board of Education (1989); Sacramento v. Rachel H (1994)*). Through these court cases and legislation, educators began to gain a better understanding that the general education classroom was to be considered as the primary setting for all students and any variation from that setting required evidence of a benefit to the student.

The concept of Least Restrictive Environment continues to be a large presence within new legislation. The Individual with Disabilities Education Act (IDEA: 1990, 1997, 2004), which was a reauthorization of Education of All Handicapped Children Act (Public Law 94-142) continues to mandate that students with disabilities participate and are educated in the LRE while being provided the necessary accommodation and adaptations to be educated in the LRE. Additionally, IDEA (2004) has increased the accountability requirements for educators to ensure that students with disabilities reach high levels of achievement on the same standards-based assessments as students without disabilities.

As time has passed, students with disabilities have been included in the general education setting at a greater rate. Additionally, the attitudes around including students with disabilities in the general education setting have also changed considerably since

Wallin's time; when students with disabilities were seen as driftwood and positive irritants. Educators who work with students with disabilities and the peers without disabilities both have a more positive attitude towards students with disabilities (Burns, Storey, & Certo, 1999; Yazbeck, McVilly, & Parmenter, 2004; Moore, Gilbreath, & Maiuri, 2002). Staub and Peck (1994) reviewed the literature and found five positive themes as a result of students with disabilities being educated in the general education setting. They found a reduction in fear of human differences, growth in social cognition, improvements in self-concepts, development of personal principles, and positive friendships (Staub & Peck, 1994).

The road for students with disabilities being able to be educated in the general education settings has been long and has required advocacy, litigation, legislation, and changes in attitudes and understanding. In part, these changes occurred as a result of a desire to increase the academic outcomes of students with disabilities. In the next section, the research regarding the relationship between students with disabilities being educated in the general education setting and the academic outcomes for students with and without disabilities will be summarized.

Achievement

Students with Disabilities

The first statistically significant look at the overall efficacy of placement for students with disabilities in regards to academic achievement was conducted by Calberg and Kavale (1980). The authors completed a meta-analysis of 50 research studies that looked at the results of special versus regular class placements on students with disabilities. This research was pivotal in the study of class placements and students with

disabilities. Until the point of this meta-analysis, the previous research had demonstrated mixed results, often because of methodological issues. The authors explained the lack of conclusive evidence on three possible factors. The first factor is that the setting, either special or general, has minimal impact on students with disabilities. If this were the case, it would explain the lack of substantial significance in the studies or at least the mixed results. The second factor is one of statistical power. The authors proposed it is the lack of the "ability of statistical tests to detect statistically significant difference among groups" that may interfere with researchers identifying clear results (Calberg & Kavale, 1980, p. 297). The third factor is internal validity, in that much of the research lacked comparison groups. Additionally, as a result of the nature of the research, random assignments were not always possible. Without the random assignments, researchers cannot confidently know that one group did not already have an advantage over another group prior to the intervention because of with-in group difference.

With these confounding factors in mind, Calberg and Kavale (1980) completed a meta-analysis. They began with a review of the literature and found a pool of 860 articles. They used a selection process to narrow down the pool to 50 articles using specific criteria. The criteria they used to narrow down the pool included: the study investigated education placement for a specific disability, the study included a comparison group, and the study had to report results that were appropriate for the transformation into the meta-analysis. As a result of the transformation of the studies, an effect size was reported. The 50 studies the authors used created 322 effect sizes to analyze.

As a result of the meta-analysis, the authors were able to conclude that the average student with a disability in a special class was approximately one-tenth of a standard deviation below the average student with a disability in a general education class regardless of the measure (achievement, personality/social, or other dependent variable). They found a -0.12 effect size for the average student in a special education classroom. There was a range of 1.98 to -1.31 and a median of -0.10 in the effect sizes. More than half of the effect sizes were negative. The authors further disaggregated the data based on three disability categories: Mental Retardation (MR) (-0.14 effect size), Slow Learner (SL) (-0.34 effect size), and Learning Disabled (LD) and Emotional/Behavioral Disability (ED/BD) (0.29 effect size). The effect sizes for the students identified with a LD and ED/BD indicated a positive result in a special education setting while for the students identified with MR and SL a negative result was found. Therefore, if a student has a disability based on a lower IQ, he or she does better in a general education class than in a special education class. The authors also concluded, based on the results of the meta-analysis, that the more valid the research study the "greater the treatment effect in favor of regular class placement" (Calberg & Kavale, 1980, p. 304).

In a synthesis of several meta-analysis research studies conducted in the 1980s and early 1990s, Baker, Wang, and Walberg (1994-95) concluded, there is a small to moderate positive effect of inclusive education practices on the academic and social outcomes of students with disabilities (Calberg & Kavale, 1980; Wang & Baker, 1985-86). The authors state, "Considerable evidence from the past 15 years suggest that segregation of special students in separate classrooms is actually deleterious to their

academic performance and social adjustment, and that special students generally perform better on average in regular classrooms" (Baker, Wang, & Walberg, 1994-95, p. 34).

Students without Disabilities

In the two previous studies, Calberg and Kavale (1980) and Baker, Wang, and Walberg (1994-95) looked at the impact of setting on students with disabilities. In an effort to further explore the impact of students with disabilities in the general education setting, Salend and Duhaney (1999) completed a review of the literature to determine the impact on achievement for students with and without disabilities. Based on their review of the research from the 1990s, Salend and Duhaney (1999) concluded that programs focusing on serving students with disabilities in the general education setting resulted in "improved educational outcomes for students with disabilities, including improved standardized test scores, reading performance, mastery of Individual Education Plan (IEP) goals, grades, on-task behavior, motivation to learn, and greater success in making the transition to adulthood" (Salend & Duhaney, 1999, p. 6). They also found that, "placement in an inclusive classroom does not interfere with the academic performance of students without disabilities with respect to the amount of allocated and engaged instructional time, the rate of interruptions to planned activities, and the students' achievement test scores and report card grades" (Salend & Duhaney, 1999, p. 9). The authors reported that students without disabilities also have more positive views of having students with disabilities in the classroom and they see increased long term benefits including increased understanding, acceptance, and awareness of individual differences.

To further understand the impact of students with disabilities in the general education setting on the nondisabled peer, Huber, Rosenfeld, and Fiorello (2001), looked at the impact on High, Average, and Low achieving general education students. In this study, the authors investigated the achievement rates of the students over three years in a school district that implemented two years of inclusion and inclusionary practices. In-service training for all staff members regardless of whether they were teaching a student with a disability was conducted. The in-service training included training on support teams, academic programs and instruction, assessment, and team teaching approaches. The authors studied the impact of the initiative and made two comparisons. They first looked at the results on the achievement of the High, Average, and Low students without disabilities across three years of instruction while the inclusionary practices were being implemented. The second comparison considered the impact of having a student with a disability in the classroom on the reading and math achievement of general education students. In particular, they examined the impact on high achieving students in comparison to average or low performing general education students.

The total sample was 410 students in grades 1 through 5 in three schools in one district. The majority of the students identified as having a disability were identified as Learning Disabled. In the first comparison, the authors found that as the school began to implement the strategies, the gains in reading levels and math levels of the low and average performing groups were higher than the high performing group. For the second comparison they found no statistically significant difference among group means with the inclusion of students with disabilities into the classrooms in the area of reading and found mixed results in the area of math. The authors concluded that based on their study,

inclusive practices "may contribute to different rates of achievement gains for general education students" with the lowest performing students benefitting the most (Huber, Rosenfeld, & Fiorello, 2001, p. 502). Additionally, they found that the inclusion of students with disabilities into general education classrooms did not have a statistically significant effect on the reading and had mixed results with math.

School Level: Students with Disabilities

Much of the previous research has looked at the impact on an individual student with disabilities being in the general education classrooms. Little of the research looked at the impact of the overall inclusiveness of the setting on students with disabilities. Rea, McLaughlin, and Walther-Thomas (2002) studied how a setting considered as inclusive to students with disabilities might impact the academic and behavioral outcomes of students identified as having a learning disability (LD) at the middle school level in comparison to a setting that was not considered as inclusive. The researchers studied two middle schools within the same district. One school was qualitatively and quantitatively described as inclusive by serving students with disabilities in the general education classroom (36 students identified as LD) and the other was described as being a pull-out model (22 students identified as LD) in that the students with disabilities received their special education services in a special education setting. The differences included the service delivery model (inclusive versus pull-out), type and intensity of the special education delivery, staffing resources, number of students with disabilities in general education classes. The teachers in the inclusive school created a model of team teaching and collaborative planning. While the special education teachers in the pull-out model

worked with the general education teachers; they did not teach together in the same classroom.

The students in the two schools were statistically determined as comparable based on age, gender, race, socio-economic status, mother's education level, disability, cognitive score, years receiving special education, and years enrolled in district. The population studied was 8th grade students identified as LD. The authors found the "students served in inclusive classrooms earned higher grades, achieved higher or comparable scores on standardized tests, committed no more behavioral infractions, and attended more days of school than the students in the pullout program" (Rea, McLaughlin, & Walther-Thomas, 2002, p. 203).

School Level: Students without Disabilities

Again, looking at the overall setting of an educational program but adding students without disabilities, McDonnell, Thorson, Disher, Mathot-Buckner, Mendel, and Ray (2003) completed an exploratory study evaluating inclusive settings on the achievement of students with disabilities and their nondisabled peers. The authors' study consisted of 5 elementary schools that enrolled a total of 18 students with developmental disabilities, of which 4 were removed for varying reasons, such as the student moved out of the district. A total of 324 students were enrolled in classes considered as inclusive to students with disabilities. A total of 221 students were enrolled in classes considered as not including any students with disabilities.

Two assessments were used to assess students: the Scales of Independent Behavior- Revised (SIB-R) was used to measure adaptive behaviors and the Utah Core Assessments, a criterion referenced assessment, was used to evaluate the students'

mastery in reading/language arts and mathematics. A pretest-posttest design was used to assess gains on the SIB-R and a posttest only design was used on the Utah Core Assessment to measure differences in inclusive classes and comparison classes. The study found statistically significant gains for students with disabilities in the area of adaptive behavior as measured on the SIB-R. The study also found no statistically significant difference between the students without disabilities in the inclusive classes and those who were in the comparison classes on the Utah Core Assessment in the areas of reading or mathematics. The authors concluded there were statistically significant gains for students with disabilities in the area of adaptive behaviors and there was no negative impact for the students without disabilities in the areas of academic achievement as measured on the Utah Core Assessment.

District Level: Students with and without Disabilities

Adding to the overall understanding Ryndak, Readon, Benner, and Ward (2007) described the results of a case study of a district's progress towards becoming more inclusive in how it educates students, over a seven-year period. Within the case study, the district being studied used a variety of quantitative measures, including descriptive statistics, assessment outcomes, and their state's accountability reports to assess the outcomes of becoming more inclusive. As the district became more inclusive and as students with disabilities were being increasingly served in their neighborhood schools, their state's Department of Education's grade of each of the schools either maintained or improved. The grade given by the state was based on achievement results in the areas of reading, math, and writing on the state's achievement tests. The district found an upward

trend in their grade that was concurrent with the increase of students with disabilities attending their neighborhood schools.

Mixed Results

In a more recent review of literature, Lindsay (2007) completed an international historical review of the literature published between 2001 and 2005 looking at the effectiveness of inclusive education. Unlike typical systematic reviews, which complete searches based on key words, Lindsay began with 1,373 articles in eight journals (i.e. *Journal of Special Education, Exceptional Children, Learning Disabilities Research and Practice, Journal of Learning Disabilities, Remedial and Special Education, British Journal of Special Education, European Journal of Special Needs Education,* and *International Journal of Inclusive Education*) related to special education. Each issue was examined and papers were selected based on relevance to the inclusive practices of serving students with disabilities in the general education setting. The author indentified fourteen papers with comparative outcomes for students with disabilities in social or educational areas. None of the articles used Randomized Controlled Trials, two were reviews, nine compared students with disabilities in different settings, and five compared students with disabilities and students without disabilities. Six of the articles had an academic focus. There was a wide range of ages and disabilities studied within the articles reviewed. Lindsay concluded based on the review of current research and the historical reviews of the literature that had occurred previously that, "the weight of evidence reviewed in this paper cannot be said to provide a clear endorsement for the positive effects of inclusion" (Lindsay, 2007, p. 16). The overall results of the studies reviewed had marginally positive results.

In another recent review of the literature, Kalambouka, Farrell, Dyson, and Kaplan (2007) completed a systematic review of the literature to determine whether the placement of students with disabilities within the general education setting has an impact on the academic outcomes of students without disabilities. Starting with a pool of 7,137 papers, which were reduced to 119 papers based on the titles and abstracts. The authors read the 119 papers and determined if the papers met the criteria to be used in the study. To be included, the studies needed to report the results of empirical research versus theoretical or exhortatory, report the impact of the intervention longitudinally or by comparing schools, and were focused on ages 5-16. Based on those three criteria, the authors further reduced the selection to 26 studies. The studies' outcomes were then coded as positive, negative, or neutral depending on the impact on the achievement of students without disabilities. Overall, they found no adverse effects on the achievement of students without disabilities in regards to the inclusion of students with disabilities. The authors also found 27% of the outcomes on achievement measures were positive, 63% were neutral, and 10% were negative findings. They concluded that as a result of these studies, educators should be inviting of students with disabilities because it addresses the two issues of being more inclusive and raising achievement.

Impact on a National Assessment

Farrell, Dyson, Polat, Hutcheson, and Gallannaugh (2007) studied the relationship between achievement on a national assessment and "inclusive" schools in England. The authors differentiated the level of the school's inclusivity by defining "school inclusivity" as "the proportion of pupils with SEN (Special Education Needs) in the school" (Farell et al., 2007, p. 135). The study brought together two large data sets. The first was the

results of the national assessments for all students. The second was the "pupil-level Annual Schools Census" data, which includes descriptive data including special education needs status. They completed a statistical analysis of the two national data sets that included over two million children. The authors investigated the relationship between the proportion of students with disabilities in a school's population and the overall outcomes on a national assessment for the students in that school. The researchers found "a small, but for all practical purposes, insubstantial relationship between inclusion and academic achievement at the school level." (Farrell et al., 2007, p. 131). The authors were able to conclude there was no negative impact on student academic achievement based on the proportion of students with disabilities within the schools. They further concluded there were other within school factors that had much larger impacts on the achievement of the students (i.e. high levels of disadvantaged students, teacher/leader skills).

Overall, there is support for inclusive practices on the part of teachers, parents, and the government; however, there appears to be less agreement on about the overall impact of educating students with disabilities in the general education setting on achievement outcomes (Farrell et al., 2007). Additionally, there are elevated concerns in the schools about the impact of being inclusive on accountability measures (Farrell et al., 2007). Schools are struggling with increased pressure to perform on accountability measures and at the same time they are struggling with being more inclusive of students with disabilities (Evans & Lunt, 2004; Ainscow et al., 2006).

Accountability

While many educators have struggled to meet the needs of students with disabilities in the general education classroom, there has also been a surge of increased accountability from the public and legislation. Accountability, in a general sense, is the responsibility placed on educators by the public to measure up to a standard or benchmark. In the school setting this is typically measured by state assessments. As a result of students with disabilities being a subgroup on these state assessments, educators are being scrutinized in their ability to successfully or unsuccessfully educate students with disabilities. Historically, students with disabilities were often exempt from such assessments (Almond, Tindal, & Stieber, 1997). As a result, some educators may have felt they weren't responsible for the outcomes of students with disabilities. However, this has changed and educators are now accountable to ensure all students, including students with disabilities, are having positive outcomes.

An underlying philosophical belief that drives these high stakes states assessments and the inclusion of students with disabilities is the belief that all children can learn and educators are responsible in making sure all students learn. Consequently, one of the goals of state assessments is to improve student achievement (Crawford & Tindal, 2006). Educational measures and quantitative analysis have been used in an attempt to improve the efficiency of the educational process since the early part of the 19th century and the beginning of the industrial revolution (Bethel, 2008). In part, state assessments then should be a way for educators to show they have appropriately supported and instructed all the students (Crawford & Tindal, 2006).

At the same time, there are teachers and administrators who have reported concerns about the negative impact of high stakes assessment on students with disabilities such as concerns that the assessments are overwhelming and stressful for students with disabilities (DeBard & Kubow, 2002; Crawford, Almond, Tindal, & Hollenbeck, 2001). However, there is evidence that the curriculum for students with disabilities has become more rigorous and more similar to the curriculum for general education students, in part, as a result of high stakes assessment (Olson, 2004).

Legislation

Much of the increased accountability has come in the form of legislation. The development of the state assessments began at a national level with the passing of the Elementary and Secondary Education Act (ESEA) of 1965. The ESEA, which provided funds to states for the education of students with disabilities, also had a system of accountability called the Title I Evaluation and Reporting System (TIERS). As a result of TIERS, educators were asked to be accountable for results when they received federal funding for education. Shortly after, in 1969, the National Assessment of Educational Progress (NAEP) began to be used as a large national assessment measuring what students know and can do academically (U.S. Department of Education, 2010).

In 1994, the Goals 2000: Educate America Act pushed the envelope on national standards and stated among other things, "all children in America will start school ready to learn" and "United States students will be first in the world in mathematics and science achievement" (Goals 2000, 1994). However, Goal 2000 did not directly require any assessment related to the act. The Improving America's Schools Act of 1994 (IASA) required annual assessments in the areas of reading and mathematics. The IASA laid the

foundation for later legislation by requiring annual assessment of students, assessments that indicate a student's level of proficiency in academic subjects, and results that can be disaggregated by subgroups including students with disabilities (IASA, 1994).

In 2001, Congress passed the No Child Left Behind (NCLB) act which was a reauthorization of the Elementary and Secondary Act (ESEA) of 1965. NCLB holds schools accountable for the academic progress of all students, including students with disabilities. The overall intention of NCLB is to have high expectations for schools across the country. By the year 2014, 100% of students are to score at a proficient level on academic assessments in the areas of communication arts and mathematics. Educators have 12 years in which to assess students using standardized assessments and make changes to the instruction and educational practices in order to achieve the Annual Yearly Progress (AYP) benchmark. AYP is the yearly benchmark set by the government that schools are to meet each year in order to show progress towards the 2014 goal. Students with disabilities are disaggregated into a subgroup called the IEP subgroup and educators need to show that all of their subgroups are also meeting AYP.

If a school does not meet the AYP benchmark there are consequences outlined in NCLB. The first year a school or district does not meet the AYP benchmark in a subgroup, the district is required to inform parents that the school or district did not meet the benchmark. If a school or district continues to not meet the benchmark, there are increasing penalties, including the possibilities of losing funding or being taken over by the state. The consequences for not meeting AYP are real; there have been districts in Missouri that have been taken over by the state as a result of poor performance. Along with the formal sanctions placed on educators and schools by NCLB, there are the

informal non-legal repercussions of not meeting AYP. There are social demands and criticisms placed on the schools by the families and the communities in which they serve. There is increasing media scrutiny of the staff and leadership. There are internalized pressures to perform placed on educators by the leadership and the educators themselves. All these formal and informal consequences for low performance have increased the burden district, schools, and educators feel on a regular basis.

The reauthorization of IDEA (2004), the legislation that oversees special education, was written to align with the NCLB act in regards to assessment and accountability. IDEA requires a state to include all students with disabilities in the state assessment. Together, NCLB and IDEA have increased the demands on educators to meet academic goals for both students with and without disabilities.

In the State of Missouri, the Missouri Assessment Program (MAP) is used to assess students' progress on the Show-Me Standards and to meet the requirements for NCLB. The MAP is an assessment tool that was originally designed to meet the requirements of the Outstanding Schools Act of 1993. The Outstanding Schools Act required Missouri's Department of Elementary and Secondary Education (DESE) to identify the skills Missouri students should have by the time they graduate. In an effort to achieve this requirement, Missouri created the Show-Me standards which describe the academic standards for each grade level. The MAP was then created as a tool to assess students and districts in their progression towards proficiency on these standards. The MAP assessment is a standardized criterion referenced assessment which is given to all students in Missouri grade 3-8. The overall assessment typically takes 3-5 hours to complete and there are three types of questions: multiple choice, constructed response,

and performance events. The standardization of the MAP lends itself well to being used to compare districts in their level of effectiveness of the educational programs (Missouri Department of Elementary and Secondary Education, n.d.). DESE has concluded that the MAP is "both reliable and valid measures of achievement relative to the Show-Me standards" (Missouri Department of Elementary and Secondary Education, n.d.). For student's with statistically significant disabilities, that have a more functional curriculum and are unable to take the MAP despite be given accommodations, there is an alternative assessment called the MAP-A. The MAP-A assesses a student's level of accuracy, level of independence, and is connected to the alternative grade level expectations.

Other Factors

Covariates

There are many additional factors that can account for a student's success in school outside of the setting in which he or she is educated. Social Economic Status (SES) is one factor that has had a researched and connected relationship with academic success for over nine decades (Harwell and LeBeau, 2010). Although there are several definitions in the research for SES, it has been used as a covariate in many educational research studies (Harwell and LeBeau, 2010). One method of collecting information about a population's SES has been to use the statistic of Free and Reduced Lunches (FRL) that are provided by a school. There are some concerns about the use of FRL as a measure of SES for a school as a result of the way the data is collected and the overall definition of SES (Harwell and LeBeau, 2010). However, FRL tends to be the standard method for looking at SES and is the most frequently used measure of poverty in the educational research (Kuriki et al., 2005). Additionally, NCLB uses FRL as an indicator

of SES as seen by the fact there is a FRL subgroup for which schools need to report the AYP progress.

Additional factors that have been identified as accounting for some variation in achievement have been related to district resources. District resources can be described as financial or personnel. Financial resources can be described or measured by the amount of money a district is funded based on the Average Daily Attendance (ADA). The higher the ADA, the more financial resources a district has to spend. Personnel resources, which are related to a district's financial resources, can impact students as a result of class sizes and teacher to student ratios. Overall, there is considerable research indicating there is a relationship between a district's resources and the achievement of the students (Jimenez-Castellanos, 2010; Archibald, 2006).

A fourth factor that may have an impact on student achievement is the disability incidence rate within a school. Although, there does not appear to be a strong research base for this factor, the disability incidence rate is reported for each school in the state of Missouri with a comparison to the state average. Districts have been identified as having too high of a disability incidence ratio and have been required to work towards lowering the rate. A districts' disability incidence rate is reported as part of the Missouri State Performance Plan (SPP) data in the special education profiles for the district along with other SPP data.

Summary

The overall movement towards serving students with disabilities in the general education classroom with nondisabled peers has taken time. This chapter identified the historical framework in which the past research had taken place and in which this study

takes place. This chapter also identified the key research on the overall effect that students with disabilities in the general education setting have on a wide range of students. The results have been mixed, but for the most part there is an indication that the results are positive or at the least they are not negative. However, with ever increasing levels of accountability on educators, there has been little research on the effect students with disabilities in the general education setting might have on high-stakes state assessments. This study adds to the knowledge educators can use to better understand the relationship between the setting and the impact on the state assessment.

CHAPTER III

METHODOLOGY

Overview

There are philosophical, ethical, social, civil, legislative, and educational reasons students with disabilities are increasingly being served in the general education setting. However, as educators continue to feel the pressure to perform better on state assessments and meet the Annual Yearly Progress (AYP) benchmark, there will continue to be questions around which settings are the most effective in teaching academics to students with disabilities. With the trend in Missouri towards increased participation in the general education setting for students with disabilities, there will be questions on the part of educators on how this trend will impact a district's results on the state assessment. This chapter describes the research questions for this study, sources for data collection, the population, and the data analysis.

The purpose of this study was to determine the impact of the amount of time students with disabilities spend in the general education setting have on the Missouri Assessment Program's (MAP) assessment for students with and without disabilities. The study also considered the influence of four covariate factors reported to have an impact on student achievement (Harwell and LeBeau, 2010; Kuriki et al., 2005; Jimenez-Castellanos, 2010; Archibald, 2006). These covariates included the student to classroom teacher ratio, a district's expenditures per pupil (ADA), the percentage of free and reduced lunches (FRL) (an indicator of Social Economic Status (SES)), and the ratio of students identified with disabilities within each school. In order to identify the impact, several quantitative analyses were used including descriptive analysis, Pearson

correlations, stepwise multiple regressions, and one-way ANOVAs. This study considered three research questions to determine the impact the amount of time students with disabilities spend in the general education setting have on the MAP assessment for students with and without disabilities.

Research Questions

1. What is the impact on Missouri Assessment Program's Communication Arts assessment for students with and without disabilities based on the amount of time students with disabilities spend in general education classrooms?

   Null Hypothesis: There is no impact on Missouri Assessment Program's Communication Arts assessment for students with disabilities and without disabilities based on the amount of time students with disabilities spend in general education classrooms.

   Research Hypothesis: The Missouri Assessment Program's Communication Arts assessment for students with disabilities and without disabilities will be positively influenced based on increases in the amount of time students with disabilities spend in general education classrooms.

2. What is the impact on Missouri Assessment Program's Mathematics assessment for students with and without disabilities based on the amount of time students with disabilities spend in general education classrooms?

   Null Hypothesis: There is no impact on Missouri Assessment Program's Mathematics assessment for students with disabilities and without disabilities based on the amount of time students with disabilities spend in general education classrooms.

Research Hypothesis: The Missouri Assessment Program's Mathematics assessment for students with disabilities and without disabilities will be positively influenced based on increases in the amount of time students with disabilities spend in general education classrooms.

3. Does a change in the amount of time students with disabilities spend in general education across a three-year period (i.e. 2008 - 2010) impact scores on Missouri Assessment Program's Mathematics and Communication Arts assessment for students with and without disabilities?

   Null Hypothesis: There is no impact on Missouri Assessment Program's Mathematics and Communication Arts assessment for students with and without disabilities based on changes in the amount of time students with disabilities spend in general education across a three year period.

   Research Hypothesis: The Missouri Assessment Program's Mathematics and Communication Arts assessment will be positively influenced for students with and without disabilities based on increases in the amount of time students with disabilities spend in general education across a three-year period (i.e. 2008- 2010).

Data Sources

To address the research questions, data for this study were obtained from Missouri's Department of Elementary and Secondary Education (DESE). The data reported on the website was collected and reported from schools across the state for three different sources of public information: Missouri State Performance Plan (SPP) data, which is reported as Special Education Profile data on the DESE website; School Accountability Report Card data; and the Annual Performance Report (APR), which

reports a school's Annual Yearly Progress (AYP) towards the yearly benchmark on the state assessment. The three sources of data were obtained for each district on DESE's School Statistics website (http://dese.mo.gov/schooldata/school_data.html), on the Annual Reporting of School District Data FTP Downloading Site (http://dese.mo.gov/schooldata/ftpdata.html), and through electronic correspondence with Mary Corey, the Director of Data Coordination at DESE.

The SPP information contained in the Special Education Profile data on the DESE website is reported for each district to provide the statistics required by the Individuals with Disabilities Education Improvement Act of 2004. Missouri's SPP describes targets for student performance in various areas that districts must report to the state. The Special Education Profile is the public report regarding the performance of districts on the SPP Indicators. This study utilized two of the SPP indicators for each district in the analysis: 1) The amount of time students with disabilities were included in the general education classroom setting within a school (independent variable); and 2) the ratio of students identified with disabilities (covariate). The first of these indicators, the amount of time students with disabilities were included in the general education classroom setting within a school, was obtained directly from the Director of Data Coordination at DESE, through electronic correspondence. The data were sent electronically as a spreadsheet for the years 2008-2010. The second indicator, ratio of students identified with disabilities is reported at the district level for the SPP. The disability ratio was calculated for each school based on the number of students with disabilities taking the MAP assessment for each year.

Independent Variables: The percentage of time students with disabilities participated in the general education setting was obtained from DESE and was reported at the school level. The percentages of students with disabilities educated in the general education setting are reported for three ranges: 80% or more of the time, 79- 40% of the time, and 39% or less of the time. For example, the percentage of students with disabilities educated in the general education setting for each range for the state of Missouri are reported in Table 2. There are additional environments in which a student may be educated. These are considered as separate settings such as separate public school, separate private school, homebound/hospital, and correctional facilities. For the purpose of this study, these separate environments were not included.

The percentage of time students with disabilities spend in the general education setting is reported by the districts to the state annually on December 1st. Since the SPP data is taken in the middle of the school year, the data would be representative of the environment for that school year. As a result, the previous calendar year's SPP data was used with the following year's MAP data (i.e. The December 1, 2009 SPP data was analyzed with the MAP results for 2010 since they are collected during the same school year).

Each elementary school has a percentage of students with disabilities educated in the general education setting for each of the ranges. The percentage of time students with disabilities are educated in the general education setting varies among the schools and this provided a reference point to determine the amount of influence the setting has on the MAP assessment outcomes.

Covariates: The first of the covariates, the ratio of students identified with disabilities, was obtained via SPP data as previously described. The three remaining covariates were found on The School Accountability Report Card which is reported on the DESE website. The School Accountability Report Card meets the accountability requirements set by state (Section 160.522) and federal law (NCLB). Section 160.522 of the Missouri state law requires DESE to produce an accountability report card for each district, including the years 2008, 2009, and 2010. The accountability report provides information on several factors which were used in the analysis for this study: 1) percentage of students available for FRL by district; 2) students to classroom teacher ratio by district; and 3) expenditure per ADA by district.

These three covariates are reported as district level data while disability ratio is reported as school level data. The first of the three district level data was the student to classroom teacher ratio and was reported on DESE's website as part of the School Accountability Report Card. The second variable was the ADA expenditure per student, which was the dollar amount each district spent, divided by the number of students in the district. The third variable was the percentage of FRL for a district. The percentage of students who receive FRL has been used as an indicator of socio-economic status.

Dependent Variable: The final source of data obtained from DESE was from the Annual Performance Report (APR), which reports each school's Annual Yearly Progress (AYP) towards meeting the annual benchmark. The AYP data is a measurement of how well a district performs on the state assessment, in this case the MAP. The AYP data reports the percentage of students in a school in a specific group or subgroup that scored Advanced or Proficient on the MAP assessment including the years 2008 to 2010.

Advanced or Proficient are considered scores that meet the requirements of NCLB, while scores of Basic or Below Basic are considered as not meeting the requirements of NCLB. The data is disaggregated into groups including a subgroup for students with disabilities, which is reported as an Individual Education Plan or IEP subgroup. Additionally, the results for the total population in each district are reported.

The MAP assessment is a standardized criterion referenced assessment which is given to all students in Missouri grades 3-8. The overall assessment typically takes 3-5 hours to complete and during the three years of this study there were three types of questions: multiple choice, constructed response, and performance events. The standardization of the MAP lends itself well to being used to compare districts in their level of effectiveness of the educational programs (Missouri Department of Elementary and Secondary Education, n.d.). DESE has concluded that the MAP is "both reliable and valid measures of achievement relative to the Show-Me standards" (Missouri Department of Elementary and Secondary Education, n.d.).

Population

Schools. This study began with utilizing the data from 524 districts consisting of approximately 1250 elementary schools in the state of Missouri over a three-year period (i.e. 2008, 2009, and 2010). The number of elementary schools for this study was reduced from the total number as a result of several factors, including the size of the IEP subgroup, primary elementary schools, and schools with only special education students.

The first factor was the size of the student population with IEPs taking the MAP. Schools were removed from the list if the school did not have a large enough population of students with IEPs. DESE considers a school as having an IEP subgroup if there are

30 or more students in the school identified as having an IEP that take the MAP during a given year (Missouri Department of Elementary and Secondary Education, 2011). If a school has less than 30 students with IEPs taking the MAP, then DESE does not consider the school as having an IEP subgroup for that year. In the 2008, the group size required to have an IEP subgroup was reduced to 30 students. Prior to 2008, the group size required 50 students to meet the subgroup cell size requirements (Missouri Department of Elementary and Secondary Education, 2011). As a result, this study did not use data prior to 2008.

Another factor was the removal of the primary elementary schools. Primary elementary schools are schools that have only grades kindergarten through second grade and at those levels there are no state assessments. Finally, the public separate schools were removed from the analysis since their population does not include students without disabilities and there is no general education setting. As a result of these four factors the overall number of elementary schools was reduced to $N = 362$ in 2008; $N = 405$ in 2009; and $N = 381$ in 2010.

Subgroups. For the purpose of this study, in order to obtain a Non-IEP subgroup, data from DESEs Annual Reporting of School Data FTP Downloading Site were used. The MAP AYP results for each elementary school were disaggregated by total population and IEP subgroup population. Through a process of sorting and removing the results of the IEP subgroup from the total population a new Non-IEP subgroup was created. As a result, the Non-IEP subgroup consisted of the total population of students taking the MAP with the students from the IEP subgroup removed. The AYP results were reported for Communication Arts and Mathematics for the IEP subgroup and a Non-IEP subgroup.

Data Analysis

For the purpose of this study, several data analyses were used to address the three research questions. The research questions and the analysis utilized will be addressed in the next section. Research questions 1 and 2 will be addressed simultaneously as a result of the similarities in the analysis.

Research questions 1 and 2: This study examined the impact the amount of time students with disabilities spend in general education classrooms has on the MAP Communication Arts assessment and the Mathematics assessment for students with and without disabilities using Pearson correlations, stepwise multiple regression, and one-way ANOVA.

The dependent variables for this study were the percentage of students with disabilities (IEP subgroup) and the students without disabilities (Non-IEP group) that scored Advanced or Proficient on the Mathematics and the Communication Arts assessments at the elementary level for the years of 2008, 2009, and 2010.

The independent variable for this study was the amount of time students with disabilities were educated in the general education classroom versus a special education environment. The percentages of students with disabilities in each of the three ranges (i.e. 80% of the time or greater, 79-40% of the time, and 39% or less of the time) were grouped into six categories (i.e. 80% of the time or greater, 80% of the time or greater and 79-40% of the time, 79-40% of the time, 79-40% of the time and 39% or less of the time, 39% or less of the time, and a bimodal group of 80% of the time or greater and 39% or less of the time) depending on the amount of participation in the general education setting. A school's membership in one of the six categories depended on the percentage

of the students with disabilities in each of the three ranges in that school. If a school had a percentage of students participating in general education in one of the three ranges that was greater than the average amount of participation for that range then the school was noted as having a high level of participation in that range. There were six categories to address the situation created when a school had higher than the average amount of participation in two of the ranges. As a result of this classification process, the categories were used for the ANOVA and each of the six categories of participation in general education were dummy coded for the stepwise multiple linear regression analysis. Additionally, the study incorporated four covariates including disability ratio, percentage of students available for FRL, students to classroom teacher ratios, and ADA expenditures for the multiple linear regression analysis.

The data were imported into the Statistical Package for the Social Sciences (SPSS) software system in order to provide an objective and statistical look at the impact of participation in the general education setting for students with disabilities on high stakes state assessments like the MAP for students with and without disabilities. A Pearson correlation was used to determine the stepwise order for the covariates. A stepwise multiple linear regression was then used to determine the statistical significance of the independent variables and covariates. A stepwise regression was run for both dependent variables (research questions 1 and 2) for each of the three years of this study (2008, 2009, and 2010). Finally, a one-way ANOVA was utilized to analyze the differences between the means on the dependent variable.

Research question 3: This study examined the impact the change in the amount of time students with disabilities spend in general education across a three-year

period has on scores on Missouri Assessment Program's Mathematics and Communication Arts assessment classrooms using Pearson correlations, stepwise multiple regression, and one-way ANOVAs.

In order to address the third research question the data from the previous research questions for the three years were combined. Schools that had been removed from one of the three years as a result of one of the previously mentioned reasons (e.g. no IEP subgroup) were removed leaving a list of schools (N = 262) that had data from all three years of this study.

The third research question addressed the change that occurs from one year to another versus a static picture of where a district is with its participation at a given point in time (i.e. research questions 1 and 2). As a result, the data were transformed to measure the change in participation in the general education classroom and the change in the other variables across two years (i.e. the change from 2008 to 2009, 2009 to 2010, and 2008 to 2010).

The change in the amount of participation in the general education classroom was transformed into six categories (i.e. 80% of the time or greater, 80% of the time or greater and 79-40% of the time, 79-40% of the time, 79-40% of the time and 39% or less of the time, 39% or less of the time, and a bimodal group of 80% of the time or greater and 39% or less of the time). If there was an increase from one year to the next (2008 to 2009 and 2009 to 2010) or across two years (2008 to 2010) in one of the three ranges (i.e. 80% of the time or greater, 79-40% of the time, and 39% or less of the time) that was greater than the average change then that school was identified as have an increased change in that range. All the schools were then identified as having an increase in one of the six

categories based on the change within the three ranges with the exception of one school between the years of 2008 to 2009. As a result of the remaining variables being continuous data, the change across two years was transformed into the percent of the difference with the result indicating the change in that variable between years.

The data were imported into the Statistical Package for the Social Sciences (SPSS) software system in order to complete the data analysis. A Pearson correlation was used to determine the stepwise order for the covariates. Then a stepwise regression was used to determine the statistical significance of the independent variables and covariates. A stepwise regression was run for both Communication Arts and Mathematics for each of the three possible combinations of change between years of this study (2008-2009, 2009-2010, and 2008-2010). A one-way ANOVA was utilized to analyze the differences between the means on the dependent variable.

Summary

The purpose of this study was to determine the impact of the amount of time students with disabilities spend in the general education setting have on the MAP assessment for students with and without disabilities. The study considered the influence of other factors reported to have an impact on student achievement such as student to classroom teacher ratio, a district's expenditures per ADA, the percentage of FRL, and the ratio of students identified with disabilities within each school. Data across three academic years, 2008 - 2010, were obtained from DESE and utilized in the analysis. This was the first such study to look at the impact the level of participation of students with disabilities in the general educational setting has on a high stakes state assessments like the MAP which is used to meet the assessment requirements of NCLB.

CHAPTER IV

RESULTS

Overview

The purpose of this study was to determine the impact of the amount of time students with disabilities spend in the general education setting have on the Missouri Assessment Program's (MAP) assessment for students with and without disabilities. There were three research questions developed for this study.

1. What is the impact on Missouri Assessment Program's Communication Arts assessment for students with and without disabilities based on the amount of time students with disabilities spend in general education classrooms?
2. What is the impact on Missouri Assessment Program's Mathematics assessment for students with and without disabilities based on the amount of time students with disabilities spend in general education classrooms?
3. Does a change in the amount of time students with disabilities spend in general education across a three-year period impact scores on Missouri Assessment Program's Mathematics and Communication Arts assessment for students with and without disabilities?

The data used to answer these three questions were obtained from DESE and analyzed using the statistical program SPSS. A stepwise multiple linear regression was used in order to determine the amount of explained variance the independent variable (i.e. level of participation in the general education setting by students identified as having a disability) has on the dependent variable (i.e. MAP Communication Arts and Mathematics assessment) after controlling for the covariates. The data analysis was

based on three years of data collection in elementary schools in the state of Missouri (*N* = 362 in 2008; *N* = 405 in 2009; and *N*= 381 in 2010). In addition, a one-way ANOVA was run to analyze the differences between the means on the dependent variable. This chapter will go through the results of the descriptive data analysis, results of the stepwise regression, and the results of the one-way ANOVA. Included in the descriptive statistics are the independent variables, dependent variables, and the covariates

Research Questions 1 and 2

Research question 1 addresses the impact on MAP's Communication Arts assessment and research question 2 addresses the impact on the Mathematics assessment for students with and without disabilities based on the amount of time students with disabilities spend in general education classrooms.

Descriptive Statistics

Table 3 shows the distribution of the independent variables for research questions 1 and 2 across the three years of this study. The independent variable was coded using the percentage of students with disabilities in each of the three ranges (i.e. 80% of the time or greater, 79-40% of the time, and 39% or less) of time in general education classroom by school. The three ranges were coded into six categories of participation depending on the amount of time spent in the general education setting by students with disabilities. The six coded categories were: 1) 80% of the time or greater, 2) 80% of the time or greater and 79-40% of the time, 3) 79-40% of the time, 4) 79-40% of the time and 39% or less of the time, 5) 39% or less of the time, and 6) a bimodal group of 80% of the time or greater and 39% or less of the time. Much like the state data reported previously in Table 2 there is a steady increase from 2008 to 2009 and 2009 to

2010 in the range 80% of the time or greater and 79-40% of the time, while there is a steady decrease in the range 39% or less of the time.

Table 3

Distribution of Elementary Schools for the Six Categories of Participation by Year (N = 362 in 2008; N = 405 in 2009; and N= 381 in 2010)

Category	2008	2009	2010
80% of the time or greater	99	126	131
80% of the time or greater and 79-40%	38	33	20
79-40% of the time	96	101	113
79-40% of the time and 39% or less of the time	34	50	43
39% or less of the time	50	44	31
Bimodal	45	51	43
Total	362	405	381

Table 4 shows the range, mean and standard deviation of the MAP scores in Communication Arts and Mathematics for the elementary schools in the state of Missouri for the IEP subgroup and the Non-IEP subgroup for the years 2008, 2009, and 2010. There is a steady but slow increase in MAP scores for both subgroups in Communication Art and Mathematics.

Table 4

Range, Mean, and Standard Deviation of Elementary Schools MAP scores 2008-2010

	Communication			Mathematics		
2008	Range	Mean	SD	Range	Mean	SD
IEP	0 to 78.7	25.71	13.9	0 to 80	29.03	14.68
Non-	3.3 to 91.5	53.38	14.0	1.6 to	53.26	15.83
2009	Range	Mean	SD	Range	Mean	SD
IEP	0 to 82.7	27.18	13.8	0 to 88.6	30.80	14.88
Non-	9.1 to 92.1	53.63	14.8	4.1 to	53.54	16.42
2010	Range	Mean	SD	Range	Mean	SD
IEP	0 to 73.3	29.47	13.9	0 to 96.6	34.00	15.60
Non-	8.9 to 86.2	56.29	15.1	10 to	56.61	16.08

Table 5 shows the range, mean, and standard deviation of the covariates for the three years (2008, 2009, and 2010) included in this study. Table 5 shows a steady increase in the average daily attendance (ADA) expenditures for the districts and the free and reduced lunches (FRL) percentages being claimed by districts. At the same time, student to teacher ratios and the disability ratios essentially maintain their values across the three years.

Table 5

Range, Mean, Standard Deviation of Covariates of Elementary Schools, 2008-2010

2008	Range	Mean	SD
ADA	6278 to 15549	8986.57	1928.44
Student Teacher Ratio	12 to 25	18.01	2.3
FRL	3 to 96.5	40.66	22.71
Disability Ratio	7 to 36	18	5
2009	Range	Mean	SD
ADA	6154 to 17347	9151.53	1885.06
Student Teacher Ratio	11 to 26	18.03	2.48
FRL	2.9 to 99.40	43.48	23.21
Disability Ratio	6 to 42	18	5
2010	Range	Mean	SD
ADA	6445 to 16082	9305.95	1888.28
Student Teacher Ratio	11 to 28	18.02	2.49
FRL	5.6 to 97.40	47.38	23.79
Disability Ratio	7 to 36	18	5

Table 6 shows the Pearson correlations between the covariates and the dependent variables. The Pearson correlations were used to determine the stepwise order for the covariates.

In 2008, FRL had a moderate negative correlations to the results on the Communication Arts and the Mathematics MAP assessment for the IEP subgroup (r = -.532, p <.01 and r = -.558, p = .000) and strong negative correlations for the Non-IEP subgroup (r = -.758, p = .000 and r = -.724, p = .000). The correlations between FRL and

the MAP assessment were similar for 2009 and 2010. The greater the FRL, the lower the scores were for the IEP and Non-IEP subgroups on both the Communication Arts and the Mathematics MAP assessment.

In 2008, ADA had a weak yet statistically significant negative correlations with the results on the Communication Arts and the Mathematics MAP assessment for the Non-IEP subgroup (r = -.233, p = .000 and r = -.292, p = .000). The correlations between ADA and the MAP assessment for the Non-IEP subgroup were similar for 2009 and 2010. The greater amount a district spent per student, the lower the scores were for the Non-IEP subgroup on both the Communication Arts and the Mathematics MAP assessment. ADA did not have a statistically significant correlation between the IEP subgroup on either the Communication Arts or the Mathematics MAP assessment.

In 2008, disability ratio had a weak yet statistically significant positive correlations to the results on the Communication Arts and the Mathematics MAP assessment for the IEP subgroup (r = .174, p <.01 and r = .151, p <.01). The correlations between disability ratio and the MAP assessment for the IEP subgroup were similar for 2009 and 2010. The schools with higher disability ratio had higher MAP scores on both the Communication Arts and the Mathematics MAP assessment for students in the IEP subgroup.

Table 6

Correlation Table: Covariates and Elementary Schools MAP Results, 2008-2010

	IEP Com. Arts	Non-IEP Com. Arts	IEP Math	Non-IEP Math
2008				
ADA	-.016	-.233***	-.062	-.292***
Student Teacher Ratio	.-039	.032	-.030	.078
FRL	-.532**	-.758***	-.558***	-.724***
Disability Ratio	.174**	.019	.151**	-.006
2009				
ADA	.010	-.141**	-.060	-.203***
Student Teacher Ratio	-.106*	-.072	-.085	-.007
FRL	-.520***	-.779***	-.537***	-.751***
Disability Ratio	.194***	.084	.135**	.022
2010				
ADA	.052	-.139**	-.034	-.193***
Student Teacher Ratio	-.068	-.047	-.094	-.066
FRL	-.604***	-.822***	-.542***	-.730***
Disability Ratio	.152**	-.041	.116*	-.052

*** $p = .000$, ** $p < .01$, * $p < .05$

Table 7 shows the Pearson correlations between the independent variables and the dependent variables. There was a statistically significant yet weak positive correlation between both the Communication Arts and the Mathematics assessment and the range of greater than 79% for both the IEP ($r = .282$, $p = .000$ and $r = .281$, $p = .000$) and the Non-IEP ($r = .332$, $p = .000$ and $r = .334$, $p = .000$) subgroups in 2008. The

correlations between range of greater than 79% and the MAP assessment for the IEP and Non-IEP subgroups were similar for 2009 and 2010. This means when there was an increase in a school's population of students with IEPs in the general education setting greater than 79% of the time then there was an increase in MAP scores on both the Communication Arts and the Mathematics assessment for both subgroups.

There was a statistically significant yet weak negative correlation between the range of 79% and 40% and the results on the Communication Arts and the Mathematics assessment for students in the IEP subgroup (r = -.300, p =.000 and r = -.245, p =.000) in 2008. The correlations between the range 79% and 40% and the MAP assessment for the IEP subgroup were similar for 2009 and 2010. As a school increased in the percentage of a school's population of students with IEPs in the general education setting 79% to 40% of the time, there is a decrease in MAP scores on both the Communication Arts and the Mathematics assessment for students in the IEP subgroup. At the same time, there was not a statistically significant correlation between the 79% to 40% range and the students in the Non-IEP subgroup.

For the students in the Non-IEP subgroup there was a statistically significant yet weak negative relationship between the range 39% or less and the results on MAP scores on both the Communication Arts and the Mathematics assessment for students in the Non-IEP subgroup (r = -.385, p =.000 and r = -.381, p =.000) in 2008 with similar results in 2009. As a school increases in the percentage of a school's population of students with IEPs in the general education setting only 39% or less of the time, there is a decrease in MAP scores on both the Communication Arts and the Mathematics assessment for students in the Non-IEP subgroup. At the same time there was not a statistically

significant correlation between the 39% or less range and the students in the IEP subgroup. Increases or decreases in the 39% or less range do not appear to impact the MAP scores for either the IEP or Non-IEP subgroup.

Table 7

Correlation Table: Amount of Time in General Education and Elementary Schools MAP results, 2008 - 2010

	IEP Com. Arts	Non-IEP Com. Arts	IEP Math	Non-IEP Math
2008				
Greater than 79%	.282***	.332***	.281***	.334***
Between 79% and 40%	-.300***	-.065	-.245***	-.072
39% or less	-.035	-.385***	-.100	-.381***
2009				
Greater than 79%	.246***	.263***	.265***	.274***
Between 79% and 40%	-.223***	-.082	-.205***	-.082
39% or less	-.067	-.303***	-.123*	-.321***
2010				
Greater than 79%	.137**	.155**	.123*	.132*
Between 79% and 40%	-.198***	-.125*	-.187***	-.107*
39% or less	.085	-.064	.092	-.054

*** $p = .000$, ** $p < .01$, * $p < .05$

Table 8 shows the Pearson correlations between the independent variables and the covariates. There was a statistically significant and moderate negative correlation between the FRL covariate and the greater than 79% range (r = -.422, p =.000) in 2008 with similar results in 2009 and 2010. When there was an increase in FRL there was a decrease in the number of students with IEPs being educated in the general education setting greater than 79%. At the same time, there was a statistically significant yet weak positive correlation between the FRL covariate and the less than 39% range (r = .380, p =.000). Therefore, when there was an increase in FRL, there was an increase in the number of students with IEPs being educated in the general education setting less than 39%.

The covariate of disability ratio had a similar relationship with the number of students with IEPs being educated in the general education setting. There was a statistically significant yet weak positive correlation between the disability ratio and the 39% or less range (r = .236, p = .000) in 2008 with similar results in 2009. As the disability ratio increased there was a decrease in the greater than 79% range and an increase in the 39% or less range.

ADA had a similar statistically significant yet weak negative correlation with the 79% and 40% range (r = -.330, p = .000) and a statistically significant yet weak positive correlation with the 39% or less range (r = .386, p = .000). When ADA increased there was a decrease in the number of students with IEPs being educated in the general education setting between 79% and 40% of the time while there was an increase in the 39% or less range.

When student to teacher ratio had a correlation with a range, it had a very weak negative correlation with the greater than 79% range (r = -.106, p < .05) and a very weak positive correlation with the 79% and 40% of the time range (r = .168, p < .01). As the student to teacher ratio increased, meaning more students per teacher, the amount of time students with disabilities were included in the general education setting decreased.

Table 8

Correlation Table: Covariates and Amount of Time in General Education in Elementary Schools, 2008-2010

	Greater than 79%	Between 79% and	39% or Less
2008			
ADA	.035	-.330***	.386***
Student Teacher Ratio	-.106*	.168**	-.082
FRL	-.422***	.161**	.380***
Disability Ratio	-.142**	-.042	.236***
2009			
ADA	-.013	-.265***	.417***
Student Teacher Ratio	-.060	.090	-.037
FRL	-.284***	.086	.331***
Disability Ratio	-.039	-.052	.140**
2010			
ADA	.138**	-.245***	.160**
Student Teacher Ratio	-.167**	.161**	.027
FRL	-.189***	.152**	.078
Disability Ratio	.085	.039	.082

*** p = .000, **p <.01, *p <.05

Results: Research Question 1

This study addressed the impact on Missouri Assessment Program's Communication Arts assessment for students with and without disabilities based on the amount of time students with disabilities spend in general education classrooms. The following section reports on the statistical results of the analysis conducted to answer this question.

IEP Subgroup: Table 9 shows the results of the stepwise regression of the covariates and independent variables conducted to find the best model for Communication Arts for the 2008 school year for the students in the IEP subgroup.

For the overall model, FRL, disability ratio, 80% of the time or greater and 79-40%, 79-40% of the time, 79-40% of the time and 39% or less of the time, 39% or less of the time, and bimodal predicted Communication Arts proficiency ($F_{7, 354}$ =31.980, p = .000, R^2 = .387) for the students in the IEP subgroup. The adjusted R^2 = .375 indicated these variables account for 37.5% of the explained variance in the MAP Communication Arts scores. For model one, FRL predicted Communication Arts proficiency ($F_{1, 360}$ =142.127, p = .000, R^2 = .283). The adjusted R^2 = .281 for this variable alone accounts for 28.1% of the explained variance. In model two, FRL and disability ratio predicted Communication Arts proficiency ($F_{2, 359}$ =90.215, p = .000, R^2 = .334). The adjusted R^2 = .331 for these two variables accounts for 33.1% of the explained variance in the MAP Communication Arts scores for the students in the IEP subgroup.

For the 2008 school year, IEP subgroup, on the Communication Arts assessment, the one-way ANOVA analysis indicated Levene's test of homogeneity of variance was violated as a result of statistically significant (p = .000) results; in part, because the N was

different for the varying categories. As a result, Welch's robust test of equality of means was used to determine statistical significance. For Communication Arts, the Welch robust test of equality of means for the students in the IEP subgroup was statistically significant ($F_{5, 123.241} = 13.110$, $p = .000$).

For the students in the IEP subgroup, the one-way ANOVA analysis for the Communication Arts indicated there was a statistically significant difference between groups ($F_{5, 356} = 10.235$, $p = .000$). A Tukey post-hoc test revealed that when a school was identified as having a greater than average percent of students with IEPs in the 80% of the time or greater category (31.9 ± 13.7), the students in the IEP subgroup had a statistically significant higher mean score on the Communication Arts assessment than the schools identified as having a greater than average percent of students with IEPs in the categories 79-40% of the time (20.1 ± 8.0, $p = .000$), 79-40% of the time and 39% or less of the time (20.4 ± 12.5, $p = .000$), and the 39% or less of the time (24.3 ± 19.2, $p = .046$). Schools with high participation in the bimodal category (30.1 ± 14.6) had a statistically significant higher mean score on the Communication Arts assessment than the 79-40% of the time category (20.1 ± 8.0, $p = .000$) and the 79-40% of the time and 39% or less of the time (20.4 ± 12.5, $p = .016$). There were no statistically significant differences between any of the other categories mean scores for the students in the IEP subgroup on the Communication Arts assessment.

Table 9

Multiple Linear Regression with Stepwise Comparison for the Elementary MAP-Communication Arts (IEP Subgroup) 2008

	B	*SE*	*Beta*	*T*	R^2	ΔR^2
Model 1					.283	.281
FRL	-.327	.027	-.532***			
Model 2					.334	.331
FRL	-.340	.027	-.544***			
Disability Ratio	.663	.126	.228***			
Model 3					.387	.375
FRL	-.325	.028	-.528***			
Disability Ratio	.635	.123	.218***			
80% or greater and 79-40%	-6.253	2.116	-.138**			
79-40%	-6.884	1.639	-.218***			
79-40% and 39% or less	-4.412	2.321	-.092			
39% or less	-.150	2.071	-.004			
Bimodal	.534	2.005	.013			

*** $p = .000$, ** $p < .01$, * $p < .05$

Non-IEP Subgroup: Table 10 shows the results of the stepwise regression of the covariates and independent variables conducted to find the best model for Communication Arts for the 2008 school year for students in the Non-IEP subgroup.

For the overall model FRL, ADA, disability ratio, 80% of the time or greater and 79-40%, 79-40% of the time, 79-40% of the time and 39% or less of the time, 39% or less of the time, and bimodal predicted Communication Arts proficiency ($F_{8, 353}$

=68.9450, p = .000, R^2 = .610) for the students in the Non-IEP subgroup. The adjusted R^2 = .601 indicated these variables account for 60.1% of the explained variance in the MAP Communication Arts scores. For model one, FRL predicted Communication Arts proficiency ($F_{1, 360}$ =485.522, p = .000, R^2 = .574). The adjusted R^2 = .573 for this variable alone accounts for 57.3 % of the explained variance. In model two, FRL and ADA predicted Communication Arts proficiency ($F_{2, 359}$ =254.058, p = .000, R^2 = .586). The adjusted R^2 = .584 for these two variables accounts for 58.4% of the explained variance. In model three, FRL, ADA, and disability ratio predicted Communication Arts proficiency ($F_{3, 358}$ =180.314, p = .000, R^2 = .602). The adjusted R^2 = .598 for these two variables accounts for 59.8% of the explained variance in the MAP Communication Arts scores for the students in the Non-IEP subgroup.

For the 2008 school year, the Non-IEP subgroup, on the Communication Arts assessment, the one-way ANOVA analysis indicated Levene's test of homogeneity of variance was violated as a result of statistically significant (p = .000) results; in part, because the N was different for the varying categories. As a result, Welch's robust test of equality of means was used to determine statistical significance. For Communication Arts, the Welch robust test of equality of means for the students in the Non-IEP subgroup was statistically significant ($F_{5, 123.223}$ = 8.229, p = .000).

For the students in the Non-IEP subgroup, the one-way ANOVA analysis for the Communication Arts indicated there was a statistically significant difference between groups ($F_{5, 356}$ = 10.722, p = .000). A Tukey post-hoc test revealed that when a school was identified as having a greater than average percent of students with IEPs in the 80% of the time or greater category(59.4 ± 13.8), the students in the Non-IEP subgroup had a

statistically significant higher mean score on the Communication Arts assessment than the schools identified as having a greater than average percent of students with IEPs in the 79-40% of the time (52.6 ± 8.8, p = .005), 79-40% of the time and 39% or less of the time (47.8 ± 14.1, p = .000), and the 39% or less of the time (44.0 ± 16.5, p = .046). The schools in the 80% and 79-40% of the time (53.9 ± 12.4, p = .007) and the 79-40% of the time (52.6 ± 8.8, p = .004) categories has a statistically significant higher mean score on the Communication Arts assessment than the category 39% or less of the time (44.0 ± 16.5). The 39% or less of the time (44.0 ± 16.5) had a statistically significant lower mean score on the Communication Arts assessment than the category bimodal (56.0 ± 15.3, p = .000). There were no statistically significant differences between any of the other categories means for the students in the Non-IEP subgroup on the Communication Arts assessment.

Table 10

Multiple Linear Regression with Stepwise Comparison for the Elementary MAP-Communication Arts (Non-IEP Subgroup) 2008

	B	*SE*	*Beta*	*T*	R^2	ΔR^2
Model 1					.574	.573
FRL	-.470	.-021	-.758***			
Model 2					.586	.584
FRL	-.458	.021	-.739***			
ADA	-.001	.000	-.110**			
Model 3					.602	.598
FRL	-.463	.021	-.747***			
ADA	-.001	.000	-.144***			
Disability Ratio	.383	.102	.131***			
Model 4					.610	.601
FRL	-.453	.023	-.731***			
ADA	-.001	.000	-.139***			
Disability Ratio	.399	.102	.136***			
80% or greater and 79-40%	-3.712	1.707	-.081*			
79-40%	-1.231	1.390	-.039			
79-40% and 39% or less	-1.044	1.890	-.022			
39% or less	-	1.685	-.063			
Bimodal	.440	1.618	.010			

*** p = .000, **p <.01, *p <.05

Summary: Research Question 1

The results for the 2009 and 2010 school years were similar to the results of the 2008 school year. The multiple linear regression tables with the stepwise comparisons for the MAP Communication Arts (Non-IEP and IEP subgroups) tables for 2009 and 2010 can be seen in Appendix A in tables 21 through 24. Additionally, the results of the one-way ANOVAs for the MAP Communication Arts (Non-IEP and IEP subgroups) for 2009 and 2010 can be seen in Appendix A in tables 37 through 40 and 45 through 48.

The covariates FRL (β = -.528, p = .000) and disability ratio (β = .218, p = .000) were the only covariates that were statistically significant predictors to the MAP Communication Arts scores for the students within the IEP subgroup in 2008, with similar results in 2009 and 2010. For the students in the Non-IEP subgroup, the FRL (β = -.731, p = .000) and the ADA (β = -.139, p = .000) expenditures were the only two covariates that were statistically significant predictors to the MAP Communication Arts scores in 2008 with similar results for all three years. The FRL and ADA expenditures negatively impacted the outcomes on the MAP Communication Arts scores for both subgroups. This means that as the percentage of students in a school in the FRL variable increased or as the ADA expenditures increased the outcomes on the MAP Communication Arts scores decreased. For the Non-IEP subgroup, disability ratio (β = .136, p = .000) was a statistically significant predictor to the MAP Communication Arts scores in 2008 with similar results in 2009 but not in 2010. The disability ratio for both subgroups had a positive impact on the outcomes on the MAP Communication Arts scores. As the percentage of students increased in the disability ratio the better the outcomes on the MAP Communication Arts assessment was for both subgroups.

The covariate that was not a statistically significant predictor to the outcomes on the MAP Communication Arts scores for either group was student to teacher ratio. ADA expenditures did not have a relationship to the outcomes on the MAP Communication Arts scores for the students in the IEP subgroup.

In regards to the independent variable of time spent in the general education setting by students in the IEP subgroup, the category of 80% of the time or greater did not have a relationship to the outcomes on the MAP Communication Arts scores for either group. In 2008, the categories of 80% or greater and 79%-40% (β = -.138, p = .003) and 79%-40% (β = -.218, p = .000) were statistically significant predictors to the outcomes on the MAP Communication Arts scores for the IEP subgroup. In 2009, the category of 79%-40% (β = -.148, p = .002) was a statistically significant predictor to the outcomes on the MAP Communication Arts scores for the IEP subgroup. In 2010, none of the categories of time spent in general education were statistically significant predictors.

In 2008, the category of 80% or greater and 79%-40% (β = -.081, p = .030) was the only statistically significant predictor to the outcomes on the MAP Communication Arts scores in any of the three years for the Non-IEP subgroup.

The one-way ANOVA analysis for the IEP and the Non-IEP subgroups for the Communication Arts assessment indicated there was a statistically significant difference between groups. The Tukey post-hoc test revealed that when a school was identified as having a greater than average percent of students with IEPs being in a category with a high amount of time spent in general education, the students in the IEP subgroup and Non-IEP subgroup scored better on the Communication Arts assessment than the schools identified as having a greater than average percent of students with IEPs being in a

category with a low amount of time spent in general education. Additionally, the IEP subgroup and Non-IEP subgroup in the schools with high participation in the bimodal category scored better on the Communication Arts assessment than the categories with a low amount of time spent in general education.

Results: Research Question 2

This study addressed the impact on Missouri Assessment Program's Mathematics assessment for students with and without disabilities based on the amount of time students with disabilities spend in general education classrooms. The following section reports on the statistical results of the analysis that was conducted to answer this question.

IEP Subgroup: Table 11 shows the results of the stepwise regression of the covariates and independent variables that was conducted to find the best model for Mathematics for the 2008 school year for the students in the IEP subgroup.

For the overall model FRL, disability ratio, 80% of the time or greater and 79-40%, 79-40% of the time, 79-40% of the time and 39% or less of the time, 39% or less of the time, and bimodal predicted Mathematics proficiency ($F_{7, 354}$ =32.051, p = .000, R^2 = .388) for the students in the IEP subgroup. The adjusted R^2 = .376 indicated these variables account for 37.6% of the explained variance in the MAP Mathematics scores. For model one, FRL predicted Mathematics proficiency ($F_{1, 360}$ =162.460, p = .000, R^2 = .353). The adjusted R^2 = .309 for this variable alone accounts for 30.9% of the explained variance. In model two, FRL and disability ratio predicted Mathematics proficiency ($F_{2, 359}$ =98.122, p = .000, R^2 = .388). The adjusted R^2 = .350 for these two variables accounts

for 35.0% of the explained variance in the MAP Mathematics scores for the students in the IEP subgroup.

For the 2008 school year, the IEP subgroup, on the Mathematics assessment, the one-way ANOVA analysis indicated Levene's test of homogeneity of variance was violated as a result of statistically significant (p = .000) results; in part, because the N was different for the varying categories. As a result, Welch's robust test of equality of means was used to determine statistical significance. For Mathematics, the Welch robust test of equality of means for the students in the IEP subgroup was statistically significant ($F_{5,\ 124.981}$ = 9.166, p = .000).

For the students in the IEP subgroup, the one-way ANOVA analysis for the Mathematics indicated there was a statistically significant difference between groups ($F_{5,\ 356}$ = 8.450, p = .000). A Tukey post-hoc test revealed that when a school was identified as having a greater than average percent of students with IEPs in the 80% of the time or greater category (35.4 ± 14.8), the students in the IEP subgroup had a statistically significant higher mean score on the Mathematics assessment than the schools identified as having a greater than average percent of students with IEPs in the 79-40% of the time (24.3 ± 9.7, p = .000), 79-40% of the time and 39% or less of the time (24.0 ± 13.6, p = .001), and the 39% or less of the time (26.1 ± 18.4, p = .002). Schools in the bimodal category (33.1 ± 16.1) had a statistically significant higher mean score on the Mathematics assessment than the 79-40% of the time category (24.3 ± 9.7 p = .007) and the 79-40% of the time and 39% or less of the time category (24.0 ± 13.6, p = .048). There were no statistically significant differences between any of the other categories mean scores for the students in the IEP subgroup on the Mathematics assessment.

Table 11

Multiple Linear Regression with Stepwise Comparison for the Elementary MAP-Mathematics (IEP Subgroup) 2008

	B	*SE*	*Beta*	*T*	R^2	ΔR^2
Model 1					.311	.309
FRL	-.361	.028	-.558***			
Model 2					.353	.350
FRL	-.374	.028	-.578***			
Disability Ratio	.634	.130	.207***			
Model 3					.388	.376
FRL	-.361	.030	-.558***			
Disability Ratio	.619	.130	.202***			
80% or greater and 79-40%	-6.529	2.225	-.136**			
79-40%	-5.571	1.724	-.168**			
79-40% and 39% or less	-3.291	2.441	-.065			
39% or less	-.777	2.179	-.018			
Bimodal	.494	2.109	011			

*** p = .000, **p <.01, *p <.05

Non-IEP Subgroup: Table 12 shows the results of the stepwise regression of the covariates and independent variables conducted to find the best model for Mathematics for the 2008 school year for the students in the Non-IEP subgroup.

For the overall model, FRL, ADA, disability ratio, 80% of the time or greater and 79-40%, 79-40% of the time, 79-40% of the time and 39% or less of the time, 39% or less of the time, and bimodal predicted Mathematics proficiency ($F_{8, 353}$ = 60.416, p =

.000, R^2 = .578) for the students in the Non-IEP subgroup. The adjusted R^2 = .568 indicated these variables account for 56.8% of the explained variance in the MAP Mathematics scores. For model one, FRL predicted Mathematics proficiency ($F_{1, 360}$ =396.935, p = .000, R^2 = .524). The adjusted R^2 = .523 for this variable alone accounts for 52.3% of the explained variance. In model two, FRL and ADA predicted Mathematics proficiency ($F_{2, 359}$ =223.645, p = .000, R^2 = .555). The adjusted R^2 = .552 for these two variables accounts for 55.2% of the explained variance. In model three, FRL, ADA, and disability ratio predicted Mathematics proficiency ($F_{3, 358}$ =156.663, p = .000, R^2 = .568). The adjusted R^2 = .564 for these three variables accounts for 56.4% of the explained variance in the MAP Mathematics scores for the students in Non-IEP subgroup.

For the 2008 school year, the Non-IEP subgroup, on the Mathematics assessment, the one-way ANOVA analysis indicated Levene's test of homogeneity of variance was violated as a result of statistically significant (p = .000) results; in part, because the N was different for the varying categories. As a result, Welch's robust test of equality of means was used to determine statistical significance. For Mathematics, the Welch robust test of equality of means for the students in the Non-IEP subgroup was statistically significant ($F_{5, 125.137}$ = 8.598, p = .000).

For the students in the Non-IEP subgroup, the one-way ANOVA analysis for the Mathematics indicated there was a statistically significant difference between groups ($F_{5, 356}$ = 11.010, p = .000). A Tukey post-hoc test revealed that when a school was identified as having a greater than average percent of students with IEPs in the 80% of the time or greater category (60.0 ± 14.5), the students in the Non-IEP subgroup had a statistically

significant higher mean score on the Mathematics assessment than the schools identified as having a greater than average percent of students with IEPs in the 79-40% of the time (52.2 ± 11.2, p = .004), 79-40% of the time and 39% or less of the time (47.1 ± 15.7, p = .000), and the 39% or less of the time (42.5 ± 19.4, p = .000). Schools in the 80% of the time and 79-40% of the time category (54.0 ± 12.9, p = .005) and the 79-40% of the time (52.2 ± 11.2, p = .003) had a statistically significant higher mean score on the Mathematics assessment than the 39% or less of the time (42.5 ± 19.4). The 39% or less of the time (42.5 ± 19.4) category had a statistically significant lower mean score on the Mathematics assessment than the bimodal category (55.5 ± 17.2, p = .000). There were no statistically significant differences between any of the other categories means for the students in the Non-IEP subgroup on the Mathematics assessment.

Table 12

Multiple Linear Regression with Stepwise Comparison for the Elementary MAP-Mathematics (Non-IEP Subgroup) 2008

	B	*SE*	*Beta*	*T*	R^2	ΔR^2
Model 1					.524	.523
FRL	-.505	.025	-.724***			
Model 2					.555	.552
FRL	-.484	.025	-.695***			
ADA	-.001	.000	-.177***			
Model 3					.568	.564
FRL	-.489	.025	-.701***			
ADA	-.002	.000	-.207***			
Disability Ratio	.389	.119	.118**			
Model 4					.578	.568
FRL	-.470	.027	-.674***			
ADA	-.002	.000	-.218***			
Disability Ratio	.412	.120	.125**			
80% or greater and 79-40%	-4.161	1.996	-.081*			
79-40%	-2.931	1.625	-.082			
79-40% and 39% or less	-2.235	2.210	-.041			
39% or less	-3.266	1.970	-.071			
Bimodal	.489	1.893	.010			

*** p = .000, **p <.01, *p <.05

Summary: Research Question 2

The results for the 2009 and 2010 school years were similar to the results of the 2008 school year. The multiple linear regression with the stepwise comparisons for the MAP Mathematics (Non-IEP and IEP subgroups) for 2009 and 2010 can be seen in the appendix in tables 25 through 28. Additionally, the results of the one-way ANOVAs for the MAP Mathematics (Non-IEP and IEP subgroups) for 2009 and 2010 can be seen in the appendix in tables 41 through 44 and 49 through 52.

The covariates FRL (β = -.558, p = .000) and disability ratio (β = .202, p = .000) were the only covariates that were statistically significant predictors to the MAP Mathematics scores for the students within the IEP subgroup in 2008 with similar results in 2009 and 2010. In 2009, ADA expenditure (β = -.149, p = .001) was a statistically significant predictor with the MAP Mathematics scores for the IEP subgroup but it was not for 2008 or 2010.

For the students in the Non-IEP subgroup, FRL (β = -.674, p = .000) and ADA expenditures (β = -.218, p = .000) were the covariates that were statistically significant predictors to the MAP Mathematics scores in 2008 with similar results in 2009 and 2010. In 2008 disability ratio (β = .125, p = .001) was also a statistically significant predictor to the MAP Mathematics scores with similar results in 2009 but not in 2010. In 2010, the covariate student to teacher ratio (β = -.096, p = .008) was a statistically significant predictor to the MAP Mathematics scores for the Non-IEP sub group.

The FRL negatively impacted the outcomes on the MAP Mathematics scores for both subgroups. This means the percentage of students in a school identified as FRL increased, then the outcomes on the MAP Mathematics scores decreased. The Disability

Ratio for both subgroups had a positive impact on the outcomes on the MAP Mathematics scores. As the percentage of students increased in the Disability Ratio the better the outcomes on the MAP Mathematics assessment was better for both subgroups. ADA expenditures negatively impacted the outcomes on the MAP Mathematics scores, as a result, as the ADA expenditures increased, the results on the MAP Mathematics decreased.

In regards to the independent variable of time spent in the general education setting by students in the IEP subgroup, the category of 80% of the time or greater did not have a relationship to the outcomes on the MAP Mathematics scores for either group in any of the years. In 2008, the categories of 80% or greater and 79%-40% (β = -.136, p = .004) and 79%-40% (β = -.168, p = .001) were statistically significant predictors to the outcomes on the MAP Mathematics scores for the IEP subgroup with similar results in 2009. In 2010, none of the categories of time spent in general education were statistically significant predictors to the outcomes on the MAP Mathematics scores for either the IEP or Non-IEP subgroup.

For the Non-IEP subgroup, the category of 80% or greater and 79%-40% (β = -.081, p = .038) was the only statistically significant predictor to the outcomes on the MAP Mathematics scores in 2008. The category of 79%-40% (β = -.113, p = .003) was a statistically significant predictor to the outcomes on the MAP Mathematics scores in 2009, but not 2008 or 2010 for the Non-IEP subgroup.

The one-way ANOVA analysis for the IEP and the Non-IEP subgroups for the Mathematics assessment indicated there was a statistically significant difference between groups. The Tukey post-hoc test revealed that when a school was identified as having a

greater than average percent of students with IEPs in the categories with high amounts of time spent in the general education, the students in the IEP subgroup and Non-IEP subgroup scored better on the Mathematics assessment than the schools identified as having a greater than average percent of students with IEPs in the less time in general education categories. Additionally, the IEP subgroup and Non-IEP subgroup in the schools with high participation in the bimodal category scored better on the Mathematics assessment than the categories with a low amount of time spent in general education.

Research Questions 3

Research question three addressed the impact that a change in the amount of time students with disabilities spend in general education across a three-year period has on the Missouri Assessment Program's Mathematics and Communication Arts assessment scores for students with and without disabilities.

Descriptive Statistics

Table 13 shows the distribution of elementary schools for the six categories of participation based on the amount of change students with disabilities participated in general education across two years (i.e. the change from 2008 to 2009, 2009 to 2010, and 2008 to 2010). The changes in the amount of participation were transformed into six categories. If there was an increase in the percentage of students with disabilities participating in general education from one year to the next (2008 to 2009 and 2009 to 2010) or across two years (2008 to 2010) in one of the three ranges (80% of the time or greater, 79-40% of the time, and 39% or less of the time) that was greater than the average increase in participation then the school was identified as having an increase in that range. If there wasn't an increase in participation in one of the three ranges or the

increase was less than the average increase then the school was not identified as having an increase in that range. All the schools were ultimately identified as having an increase in one of six categories based on increases in one of the three ranges with the exception of one school between the years of 2008 to 2009, which had no change. Each school had an increase in one of the six following categories 1) 80% of the time or greater, 2) 80% of the time or greater and 79-40% of the time, 3) 79-40% of the time, 4) 79-40% of the time and 39% or less of the time, 5) 39% or less of the time, and 6) a bimodal group of 80% of the time or greater and 39% or less of the time.

Table 13

Distribution of Elementary Schools for the Six Categories of Participation Based on the Change Over Two Years (N = 259 in 2008-2009; N = 260 in 2009-2010 and 2008- 2010)

Category	2008-2009	2009-2010	2008-2010
80% of the time or greater	72	67	61
80% of the time or greater and 79-40% of the	19	43	62
79-40% of the time	44	40	35
79-40% of the time and 39% or less of the	55	50	47
39% or less of the time	25	19	27
Bimodal	44	41	28
Total	259	260	260

Table 14 shows the raw score change in the range, mean and standard deviation of the MAP scores in Communication Arts and Mathematics across two years (i.e. 2008 to 2009, 2009 to 2010, and 2008 to 2010). Table 14 also shows the range of increases and decreases in the MAP scores demonstrating there is variation in the results for some schools over a two-year period. Some schools decreased in the percent of students

scoring advanced or proficient by as much as 34 points in their MAP scores from one year to another while other schools improved as much as 41 points during the same time period.

Table 14

Change in Range, Mean, and Standard Deviation of Elementary Schools MAP Scores Over Two Years

	Communication Arts			Mathematics		
2008-	Range	Mean	SD	Range	Mean	SD
IEP	-23 to 30	1.89	8.94	-21 to 29	2.33	9.49
Non-	-20 to 22	.92	5.89	-16 to 24	.50	5.83
2009-	Range	Mean	SD	Range	Mean	SD
IEP	-34 to 36	2.49	9.69	-24 to 34	3.91	9.78
Non-	-13 to 18	3.35	5.05	-11 to 26	3.96	6.01
2008-	Range	Mean	SD	Range	Mean	SD
IEP	-31 to 35	4.42	10.8	-22 to 41	5.81	11.34
Non-	-16 to 24	3.93	6.50	-19 to 27	3.94	7.71

Table 15 shows the percent of the difference as a measure of change in the range, mean and standard deviation of the MAP advanced or proficient scores in Communication Arts and Mathematics across two years (i.e. 2008 to 2009, 2009 to 2010, and 2008 to 2010).

Table 15

Percent of Difference in Range, Mean, and Standard Deviation of Elementary Schools MAP Scores Over Two Years

	Communication Arts			Mathematics		
2008-	Range	Mean	SD	Range	Mean	SD
IEP	-72.3 to 100	4.06	.21	-70.7 to 100	3.82	.20
Non-	-19.6 to 22.8	.80	.06	-22.2 to 35.6	.27	.07
2009-	Range	Mean	SD	Range	Mean	SD
IEP	-52.6 to 76.8	5.09	.19	-42.0 to 83.7	6.27	.17
Non-	-15.6 to 18.3	2.87	.05	-11.1 to 38.2	3.65	.06
2008-	Range	Mean	SD	Range	Mean	SD
IEP	-80.1 to 100	9.23	.22	-68.2 to 100	10.1	.21
Non-	-15.3 to	3.66	.06	-21.0 to 45.2	3.91	.08

Table 16 shows the change in the range, mean, and standard deviation of the covariates for this study across two years (i.e. 2008 to 2009, 2009 to 2010, and 2008 to 2010).

Table 16

Change in Elementary Schools Range, Mean, Standard Deviation of Covariates Over Two Years

2008-09	Range	Mean	SD
ADA	-1760 to 2892	320	438
Student Teacher Ratio	-6 to 6	-.3	1.9
Free and Reduced	-17.4 to 20.7	1.89	3.25
Disability Ratio	-10 to 8	0	3
2009-10	Range	Mean	SD
ADA	-1050 to 1958	163.45	348.11
Student Teacher Ratio	-10 to 11	.17	1.89
Free and Reduced	-6.80 to 19.10	3.24	3.22
Disability Ratio	-10 to 9	0	3
2008-10	Range	Mean	SD
ADA	-1447 to 3157	465.15	542.22
Student Teacher Ratio	-7 to 8	-.16	2.25
Free and Reduced	-15.60 to 21.8	7.72	4.46
Disability Ratio	-12 to 10	0	4

Results: Research Question 3

This study addressed the impact that a change in the amount of time students with disabilities spend in general education across a three-year period has on the scores on MAP's Mathematics and Communication Arts assessment for students with and without disabilities. The following sections report on the statistical analysis conducted to answer this question.

IEP Subgroup Communication Arts: Table 17 shows the results of the stepwise regression of the covariates and independent variables conducted to find the best model for Communication Arts for the change between two years (2008 and 2009) for the students in the IEP subgroup.

For the overall model, for the change between 2008 and 2009, disability ratio, FRL, 80% of the time or greater, 80% of the time or greater and 79-40%, 79-40% of the time and 39% or less of the time, 39% or less of the time, and bimodal predicted Communication Arts proficiency ($F_{7, 252}$ =3.435, p = .002, R^2 = .087) for the students in the IEP subgroup. The adjusted R^2 = .062 indicated these variables account for 6.2% of the explained variance in the change on the MAP Communication Arts scores. For model one, disability ratio predicted Communication Arts proficiency ($F_{1, 258}$ =5.361, p = .021, R^2 = .020). The adjusted R^2 = .017 for this variable alone accounts for 1.7% of the explained variance in the MAP Communication Arts scores for the students in the IEP subgroup. For model two, disability ratio and FRL predicted Communication Arts proficiency ($F_{2, 257}$ =4.775, p = .009, R^2 = .036). The adjusted R^2 = .028 for this variable alone accounts for 2.8% of the explained variance in the MAP Communication Arts scores for the students in the IEP subgroup.

One-way ANOVAs were run to assess if there were statistically significant differences between the categories of inclusion mean scores for IEP students for the 2008 school year on the Communication Arts assessment. The Levene's test of homogeneity of variance indicated the variance was homogenous. Levene's test indicated equal variances ($F_{5, 254}$ = 1.355, p = .242). As a result, the study concluded that the inclusion setting categories have approximately equal variance on the Communication Arts assessment.

The results of the one-way ANOVA indicated there was a statistically significant difference between inclusion categories for IEP students ($F_{5, 254} = 2.307$, $p = .045$) on the Communication Arts assessment. A Tukey post-hoc test revealed that when a school increased in the 80% of the time or greater category (-.56 ± 19.1) at a greater than average rate, the students in the IEP subgroup had a statistically significant lower score on the Communication Arts assessment than the schools that increased in the 79-40% of the time and 39% or less of the time (12.0 ± 23.4, $p = .047$) at a greater than average rate. There were no statistically significant differences between any of the other categories for the students in the IEP subgroup on the Communication Arts assessment.

Table 17

Multiple Linear Regression with Stepwise Comparison for change between 2008 and 2009 on the Elementary Schools MAP- Communication Arts (IEP Subgroup)

	B	*SE*	*Beta*	*T*	R^2	ΔR^2
Model 1					.020	.017
Disability Ratio	.370	.160	.143*			
Model 2					.036	.028
Disability Ratio	.361	.159	.139*			
FRL	-.457	.225	-.124*			
Model 3					.087	.062
Disability Ratio	.395	.158	.152*			
FRL	-.520	.223	-.141*			
80% or greater	-4.263	3.422	-.094			
80% or greater and 79-40%	-1.926	5.284	-.024			
79-40% and 39% or less	9.208	4.429	.144*			
39% or less	7.745	4.640	.114			
Bimodal	-1.178	4.249	-.019			

*** p = .000, **p <.01, *p <.05

IEP Subgroup Mathematics: Table 18 shows the results of the stepwise regression of the covariates and independent variables conducted to find the best model for Mathematics for the change between 2008 and 2009 school years for the students in the IEP subgroup.

For the overall model for the change between 2008 and 2009, disability ratio, ADA, 80% of the time or greater and 79-40%, 79-40% of the time, 79-40% of the time

and 39% or less of the time, 39% or less of the time, and bimodal predicted Mathematics proficiency ($F_{7, 252}$ =2.377, p = .023, R^2 = .062) for the students in the IEP subgroup. The adjusted R^2 = .036 indicated these variables account for 3.6% of the explained variance in the MAP Mathematics scores. For model one, disability ratio predicted Mathematics proficiency ($F_{1, 258}$ =6.127, p = .014, R^2 = .023). The adjusted R^2 = .019 for this variable alone accounts for 1.9% of the explained variance in the MAP Mathematics scores for the students in IEP subgroup. For model two, disability ratio and ADA predicted Mathematics proficiency ($F_{2, 257}$ =6.179, p = .002, R^2 = .046). The adjusted R^2 = .038 for this variable alone accounts for 3.8% of the explained variance in the MAP Mathematics scores for the students in IEP subgroup.

One-way ANOVAs were run to assess if there were statistically significant differences between the categories of inclusion mean scores for IEP students for the 2008 school year on the Mathematics assessment. The Levene's test of homogeneity of variance indicated the variance was homogenous. Levene's test indicated equal variances ($F_{5, 254}$ = 1.779, p = .118). As a result, the study concluded that the inclusion setting categories have approximately equal variance on the Mathematics assessment. The results of the one-way ANOVA indicated there was not a statistically significant difference between groups ($F_{5, 254}$ = .752, p = .585).

Table 18

Multiple Linear Regression with Stepwise Comparison for change between 2008 and 2009 on the Elementary Schools MAP- Mathematics (IEP Subgroup)

	B	*SE*	*Beta*	*T*	R^2	ΔR^2
Model 1					.023	.019
Disability Ratio	.378	.153	.152*			
Model 2					.046	.038
Disability Ratio	.388	.151	.156*			
ADA	1.343	.543	.151*			
Model 3					.062	.036
Disability Ratio	.409	.153	.165**			
ADA	1.344	.553	.151*			
80% or greater and 79-40%	-1.460	5.001	-.019			
79-40%	-2.002	3.340	-.043			
79-40% and 39% or less	3.649	4.149	.060			
39% or less	5.839	4.387	.090			
Bimodal	-1.111	3.982	-.019			

*** $p = .000$, ** $p < .01$, * $p < .05$

Non-IEP Subgroup Communication Arts: Table 19 shows the results of the stepwise regression of the covariates and independent variables conducted to find the best model for Communication Arts for the change between 2008 and 2009 school years for the students in the Non-IEP subgroup.

For the overall model for the change between 2008 and 2009, student teacher ratio, disability ratio, 80% of the time or greater and 79-40%, 79-40% of the time, 79-40% of the time and 39% or less of the time, 39% or less of the time, and bimodal predicted Communication Arts proficiency ($F_{7, 252}$ =3.605, p = .001, R^2 = .091) for the students in the Non-IEP subgroup. The adjusted R^2 = .066 indicated these variables account for 6.6% of the explained variance in the change on the MAP Communication Arts scores. For model one, student teacher ratio predicted Communication Arts proficiency ($F_{1, 258}$ =11.583, p = .001, R^2 = .043). The adjusted R^2 = .039 for this variable alone accounts for 3.9% of the explained variance. In model two, student teacher ratio and disability ratio predicted Communication Arts proficiency ($F_{2, 257}$ =10.961, p = .000, R^2 = .079). The adjusted R^2 = .071 for these variables account for 7.1% of the explained variance in the MAP Communication Arts scores for the students in the Non-IEP subgroup.

One-way ANOVAs were run to assess if there were statistically significant differences between the categories of inclusion mean scores for Non-IEP students for the 2008 school year on the Communication Arts assessment. The Levene's test of homogeneity of variance indicated the variance was homogenous. Levene's test indicated equal variances ($F_{5, 254}$ = .265, p = .932). As a result, the study concluded the inclusion setting categories have approximately equal variance on the Communication Arts assessment. The results of the one-way ANOVA indicated there was not a statistically significant difference between groups ($F_{5, 254}$ = .812, p = .542).

Table 19

Multiple Linear Regression with Stepwise Comparison for change between 2008 and 2009 on the Elementary Schools MAP- Communication Arts (Non-IEP Subgroup)

	B	*SE*	*Beta*	*T*	R^2	ΔR^2
Model 1					.043	.039
Student to Teacher Ratio	-.218	.064	-.207**			
Model 2					.079	.071
Student to Teacher Ratio	-.203	.063	-.218***			
Disability Ratio	.128	.041	.189**			
Model 3					.091	.066
Student to Teacher Ratio	-.235	.064	-.233***			
Disability Ratio	.121	.041	.178**			
80% or greater and 79-40%	1.588	1.344	.077			
79-40%	-.507	.893	-.040			
79-40% and 39% or less	-.179	1.116	-.011			
39% or less	1.053	1.172	.059			
Bimodal	-.156	1.068	-.010			

*** p = .000, ** p <.01, * p <.05

Non-IEP Subgroup Mathematics: Table 20 shows the results of the stepwise regression of the covariates and independent variables conducted to find the best model for Mathematics for the change between 2008 and 2009 school years for the students in the Non-IEP subgroup.

For the overall and only model for the change between 2008 and 2009, 80% of the time or greater and 79-40%, 79-40% of the time, 79-40% of the time and 39% or less of

the time, 39% or less of the time, and bimodal did not in a statistically significant way predicted Mathematics proficiency ($F_{5, 254}$ =1.109, p = .356, R^2 = .021) for the students in the Non-IEP subgroup. The adjusted R^2 = .002 indicated these variables account for .2% of the explained variance in the MAP Mathematics scores.

One-way ANOVAs were run to assess if there were statistically significant differences between the categories of inclusion mean scores for Non-IEP students for the 2008 school year on the Mathematics assessment. The Levene's test of homogeneity of variance indicated the variance was homogenous. Levene's test indicated equal variances ($F_{5, 254}$ = 2.056, p = .071). As a result, the study concluded that the inclusion setting categories have approximately equal variance on the Mathematics assessment. The results of the one-way ANOVA indicated there was not a statistically significant difference between groups ($F_{5, 254}$ = 1.109, p = .356).

Table 20

Multiple Linear Regression with Stepwise Comparison for change between 2008 and 2009 on the Elementary Schools MAP- Mathematics (Non-IEP Subgroup)

	B	*SE*	*Beta*	*T*	R^2	ΔR^2
Model 1					.021	.002
80% or greater and 79-40%	.637	1.633	.026			
79-40%	-2.115	1.096	-.140			
79-40% and 39% or less	-.630	1.367	-.032			
39% or less	-.905	1.435	-.043			
Bimodal	-1.777	1.311	-.094			

*** p = .000, **p <.01, *p <.05

Summary: Research Question 3

For the changes between 2009 and 2010 and 2008 and 2010 school years, the results were similar to the results of the 2008 to 2009 school year reported above. The similarities and differences are described in the following sections. The multiple linear regression with the stepwise comparisons for the MAP Communication Arts and Mathematics (Non-IEP and IEP subgroups) tables for 2009 to 2010 and 2008 to 2010 can be seen in the Appendix A in tables 29 through 36.

For the 2009 to 2010 and 2008 to 2010 years, the results of the one-way ANOVAs indicated there were no statistically significant difference between groups means on the Communication Arts or Mathematics assessments for the IEP or Non-IEP subgroups.

Communication Arts: For the change across two years, the only covariates that were a statistically significant predictor to the results on the MAP Communication Arts scores for the students within the IEP subgroup were FRL (β = -.139, p = .027) in 2008 to 2010 and (β = -.141, p = .020) in 2008 to 2009, disability ratio (β = .152, p = .013) in 2008 to 2009 and ADA expenditures (β = .222, p = .001) in 2009 to 2010. The FRL negatively impacted the outcomes on the MAP Communication Arts scores while the disability ratio and ADA expenditures had a positive impact on the outcomes on the MAP Communication Arts scores.

For the students in the Non-IEP subgroup, the only covariates that were a statistically significant predictor to the results on the MAP Communication Arts scores were disability ratio (β = .178, p = .004) in 2008 to 2009 and (β = .191, p = .002) in 2008 to 2010, student to teacher ratio (β = -.223, p = .000) in 2008 to 2009, and ADA

expenditures (β = .216, p = .001) in 2009 to 2010 and (β = .153, p = .013) in 2008 to 2010. Disability ratio and ADA expenditures positively impacted the outcomes on the MAP Communication Arts scores. This means that as the ADA expenditures or the disability ratio increased between two years the result on the MAP Communication Arts increased.

In regards to the independent variable of time spent in the general education setting by students in the IEP subgroup, the category 79-40% and 39% or less of the time (β = 2.079, p = .039) in 2008 to 2009 was the only statistically significant predictor to the results on the MAP Communication Arts scores based on change between two years. There were no statistically significant predictors to the results on the MAP Communication Arts scores for the Non-IEP subgroup.

Mathematics: For the change across two years, the only covariates that were a statistically significant predictor to the results on the MAP Mathematics scores for the students within the IEP subgroup were FRL (β = -.160, p = .011) in 2009 to 2010 and (β = -.155, p = .012) in 2008 to 2010, disability ratio (β = .165, p = .008) in 2008 to 2009, and ADA expenditure (β = .143, p = .021) in 2008 to 2010, (β = .159, p = .013) in 2009 to 2010, and (β = .151, p = .016) in 2008 to 2009. The FRL negatively impacted the change on the MAP Mathematics scores while the disability ratio and ADA expenditures had a positive impact on the change on the MAP Mathematics scores.

For the change across two years, the only covariate that was a statistically significant predictor to the results on the MAP Mathematics scores for the students within the Non-IEP subgroup was student to teacher ratio (β = -.204, p = .001) in 2008 to 2010

and FRL (β = -.202, p = .001) in 2009 to 2010. Student to teacher ratios and FRL negatively impacted the outcomes on the MAP Mathematics scores.

In regards to the independent variable of time spent in the general education setting by students in the IEP subgroup, the category bimodal (β = -.153, p = .030) in 2008 to 2010 was the only statistically significant predictor to the results on the MAP Mathematics scores based on change between two years. For the Non-IEP subgroup, none of the categories were statistically significant predictor to the results on the MAP Mathematics scores based on change between two years.

Summary

Overall, the amount of time students with IEPs are educated in the general education setting had a negligible negative impact on the outcomes on the Communication Arts or the Mathematics MAPs assessment for kids with and without disabilities. However, schools that had students with disabilities being in a category with a high amount of time spent in general education settings had better results on both the Communication Arts and the Mathematics assessments for both subgroups. This trend could also be seen in the high correlations between the amount of time students with IEPs are educated in general education and the results on the MAP. However, when the covariates of FRL, ADA, and disability ratio were factored into the analysis the relationship almost disappeared. This is in part due to the fact the amount of time students with IEPs are educated in the general education setting had a statistically significant correlation to the covariates as noted in Table 8. As a result, when considering the results of this study, there is a relationship between the setting and the results on the MAP. However, there are confounding variables that are having a greater

impact on the variance in the results on the MAP. The covariates could possibly explain the variance seen in the range of settings a school utilizes for their students with disabilities and ultimately explain the relationship between the setting and the results on the MAP.

CHAPTER V

SUMMARY AND CONCLUSION

Overview

This study examined the impact between the time students with disabilities spend in the general education setting along with four other covariates including free and reduced lunches (FRL), a districts expenditures (ADA), classroom teacher to student ratio, and the overall disability ratio have on the percentage of students scoring advanced or proficient on Missouri's Assessment Program (MAP) Communication Arts and Mathematics assessments for students with and without disabilities. Data were obtained from Missouri's Department of Elementary and Secondary Education (DESE) and was analyzed using Pearson correlations, stepwise multiple regression, and one-way ANOVAs. This chapter will review the statement of the problem and research questions, summarize the results, describe implications, and end with suggestions for future studies.

Statement of the Problem and Research Questions

There have been several forces, including increased understanding about disabilities, new approaches to education, advances in technology, along with the voices of families and advocates, an underlying belief in the power of education for all citizens, court cases, legislation, and overall changes in the socio-cultural belief systems, that are driving educators to increase the participation of students with disabilities in the general education setting despite reservations and criticisms by some. At the same time, there is rising tension to increase academic outcomes on state assessments. There has been little understanding about how increases in the amount of participation for students with disabilities in the general education setting impacts the results on high stakes state

assessments like the MAP for students with disabilities and their nondisabled peers. The primary purpose of this study was to understand the impact the settings in which students with disabilities are educated has on Missouri's state assessment for students with and without disabilities. In order to determine the impact the educational setting for students with disabilities has on the MAP the following research questions and hypotheses were tested.

Findings

Research Question 1: What is the impact on Missouri Assessment Program's Communication Arts assessment for students with and without disabilities based on the amount of time students with disabilities spend in general education in that school?

Null Hypothesis: There is no impact on Missouri Assessment Program's Communication Arts assessment for students with disabilities and without disabilities based on the amount of time students with disabilities spend in general education in that school.

Research Hypothesis: The Missouri Assessment Program's Communication Arts assessment will be positively impacted for students with disabilities and without disabilities based on increases in the amount of time students with disabilities spend in general education classrooms.

Based on the stepwise multiple linear regression analysis, the model was statistically significant and therefore the null hypothesis for this research question was rejected for all three years for both the IEP and the Non-IEP subgroup. The amount of time in the general education classroom did impact the scores on the MAP Communication Arts assessment. However, in looking at the coefficient analysis, the

Betas indicated the amount of variance explained by the setting categories was negligible and the covariates explained the majority of the variance.

Based on the one-way ANOVA, this study found that the greater the amount of time students with disabilities spent in general education the greater the scores on the MAP Communication Arts assessment for both students with and without disabilities which partially confirmed the research hypothesis.

Research Question 2: What is the impact on Missouri Assessment Program's Mathematics assessment for students with and without disabilities based on the amount of time students with disabilities spend in general education in that school?

Null Hypothesis: There is no impact on Missouri Assessment Program's Mathematics assessment for students with disabilities and without disabilities based on the amount of time students with disabilities spend in general education in that school.

Research Hypothesis: The Missouri Assessment Program's Mathematics assessment for students with disabilities and without disabilities will be positively impacted based on increases in the amount of time students with disabilities spend in general education classrooms.

Based on the stepwise multiple linear regression analysis, the model was statistically significant and therefore the null hypothesis for this research question was rejected for all three years for both the IEP and the Non-IEP subgroup. The amount of time in the general education classroom did impact the scores on the MAP Mathematics assessment. Again, in looking at the coefficient analysis, the Betas indicated the amount of variance explained by the setting categories was negligible and the covariates explained the majority of the variance.

Based on the one-way ANOVA, this study found that the greater the amount of time students with disabilities spent in general education the greater the scores on the MAP Mathematics assessment for both students with and without disabilities which partially confirmed the research hypothesis.

Research Question 3: Does a change in the amount of time students with disabilities spend in general education across a three-year period impact scores on Missouri Assessment Program's Mathematics and Communication Arts assessment for students with and without disabilities?

Null Hypothesis: There is no impact on Missouri Assessment Program's Mathematics and Communication Arts assessment for students with and without disabilities based on changes in the amount of time students with disabilities spend in general education across a three-year period.

Research Hypothesis: The Missouri Assessment Program's Mathematics and Communication Arts assessment will be positively impacted for students with and without disabilities based on increases in the amount of time students with disabilities spend in general education across a three-year period.

On the Communication Arts assessment, the stepwise multiple linear regression analysis found the model to not be statistically significant in the change between years 2008 to 2010 for only the IEP subgroup and therefore the study failed to reject the null hypothesis. However, based on the stepwise multiple linear regression analysis, the model was statistically significant for the change between 2009 to 2010 and 2008 to 2009 for both the IEP and the Non-IEP subgroup and in 2008 to 2010 for the Non-IEP

subgroup and therefore the null hypothesis for this part of the research question was rejected.

The change between years in the amount of time in the general education classroom did in most cases impact the scores on the MAP Communication Arts assessment. In looking at the coefficient analysis, the Betas indicated the amount of variance explained by the setting categories was negligible and the covariates explained the majority of the variance.

Based on the one-way ANOVA, this study found there was only one change between the years 2008 to 2009, where there was a statistically significant difference in the setting categories for the Communication Arts assessment for students with disabilities. The remaining changes between the years found there was not a statistically significant difference between the setting categories for either subgroup.

On the Mathematics assessment, the stepwise multiple linear regression analysis found the model to not be statistically significant in the change between years 2008 to 2009 for the Non-IEP subgroup and therefore the study failed to reject null hypothesis. However, based on the stepwise multiple linear regression analysis, the model was statistically significant for the change between 2009 to 2010 and 2008 to 2010 for both the IEP and the Non-IEP subgroup and in 2008 to 2009 for the IEP subgroup and therefore the null hypothesis for this part of the research question was rejected.

The change between years in the amount of time in the general education classroom did in most cases impact the scores on the MAP Communication Arts assessment. In looking at the coefficient analysis, the Betas indicated the amount of

variance explained by the setting categories was negligible and the covariates explained the majority of the variance.

Based on the one-way ANOVA, this study found there were no changes between the years where there was a statistically significant difference in the setting categories for the Mathematics assessment for student in either subgroup.

In the end, this study had inconsistent results for the changes between the years within the study and a clear overall conclusion is unattainable.

Summary

The variable of time students with disabilities spend in the general education setting had a statistically significant impact on the MAP assessment results. However, the overall impact is quite small in a practical sense. Furthermore, even though there is some evidence there is a relationship between a school's MAP assessment results and when there is a change in the amount of time students with IEPs are educated in the general education setting over time, this relationship also does not appear to be one of practical significance.

This study indicated that there are other variable (i.e. FRL, disability ratio, and ADA) that have a greater impact on the MAP assessment results than the setting variable for students with disabilities as past research has also shown (Harwell and LeBeau, 2010, Jimenez-Castellanos, 2010; Archibald, 2006). Although the study found that the setting did impact the MAP scores, the covariates also have a high correlation with the setting events and the impact the setting had on the MAP could be the result of the covariates influence on the settings a school utilizes to educate the students with disabilities.

There was evidence within this study the covariates were highly correlated to the setting variable. This may indicate IEP setting decisions may be based in part on the resources available in a district and school rather than the student's needs. Those districts that had higher categories of students in the FRL category tend to have a greater number of students in category with a low amount of time spent in general education and vice versa. Also, there is evidence that as districts spend a larger amount of money per students (ADA) they have a higher ratio of students in the category with a low amount of time spent in general education.

Implications

The journey for our society and our educators to become more inclusive was propelled as a result of many factors. The journey was driven as a result of having an inherent purpose and value and was started regardless of the results on standardized tests. There are many benefits that come from our society and educational system being inclusive to all students regardless of race, religion, national origin, sexual orientation, disability or ability. There is a sense and understanding by many that being inclusive in our practices is just the right thing to do.

This study showed the time students with disabilities spend in general education does not have a negative impact for students with or without disabilities in regards to the MAP assessment. When schools had increased participation in a category with a high amount of time spent in general education, the schools had increased scores on both the Communication Arts and the Mathematics assessment for both students with and without disabilities. In fact, high levels of students in a category with a low amount of time spent

in general education were shown to have a negative correlation with the results on the Communication Arts and the Mathematics assessment for students without disabilities.

As a whole, students that receive services in a special education environment (i.e. students have disabilities) did not perform as well on the MAP assessment as their nondisabled peers as indicated by the smaller percentage of students scoring at the advanced and proficient levels. This, of course, could be dismissed by the fact the students have disabilities and their disabilities impact their ability to perform on the MAP in a negative way. However, an issue remains, despite the disabilities, all students can do well on the MAP assessment as seen by many schools that had scores on the MAP for the IEP subgroup that were considerably better than the scores seen by the Non-IEP subgroup in other schools. If an IEP subgroup in one school scores significantly better on the MAP than the Non-IEP subgroup in another school then this means that the setting can have a powerful impact on the results of the MAP. In fact, the setting can become a greater influence on an individual child's success than the child's disability. However, the setting is much bigger than just special education versus general education. There are many other factors the school, educators, parents, and communities can influence that will have a direct and significant impact on the MAP scores for both students with and without disabilities.

Future Research

The purpose of this study was to look at the impact the educational setting has on high stakes state assessments, specifically Missouri's state assessment. During the study, a relationship between the covariates and the educational setting variable was identified. There appears to be relationship between a school's resources and the school's ability to

provide programming that allows for increased levels of inclusivity. Further research could look into the relationship a school's finances (ADA), the populations' social economic status, and a schools disability ratio has on the school's ability to have students with disabilities have a high amount of time spent in general education and on the school's overall ability to program effectively for students with disabilities.

An additional recommendation would be to look into each school's programming, curriculum, and teaching and the impact these variable have on the MAP results for students with and without disabilities. Why can one school's IEP subgroup score much better on the MAP assessment than another school's Non-IEP subgroup?

Additionally, accommodations on the state assessment and in the general education setting could also have an influence on a student's ability to participate in general education and to be able to effectively take the state assessment. An area for future research might look at how a school's resources impact its ability to provide those accommodations.

Conclusion

This study has shown that the educational settings in which students with disabilities are educated have an impact on state assessments. However, the impact is small and the educational settings have a strong relationship with a school's resources and the overall student make up. Educators and society should continue to push for ever better levels of inclusivity for all groups of students. They should not push for inclusivity just because it may help the results on the state assessment but because it is the right thing to do, it is good for the students, and for the communities in which they live and work on a daily basis.

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APPENDIX A

TABLES

Table 21

Multiple Linear Regression with Stepwise Comparison for the Elementary MAP - Communication Arts (IEP Subgroup) 2009

	B	*SE*	*Beta*	*T*	R^2	ΔR^2
Model 1					.270	.268
FLR	-.309	.025	-.520***			
Model 2					.314	.310
FLR	-.313	.025	-.526***			
Disability Ratio	.587	.116	.209***			
Model 3					.340	.329
FLR	-.314	.026	-.528***			
Disability Ratio	.599	.115	.199***			
80% or greater and 79-40%	-3.718	2.213	-.074			
79-40%	-4.717	1.527	-.148**			
79-40% and 39% or less	-.806	1 .939	-.019			
39% or less	.769	2.061	.017			
Bimodal	.979	1.886	.024			

*** p = .000, ** p <.01, * p <.05

Table 22

Multiple Linear Regression with Stepwise Comparison for the Elementary MAP-Communication Arts (Non-IEP Subgroup) 2009

	B	*SE*	*Beta*	*T*	R^2	ΔR^2
Model 1					.606	.605
FLR	-.499	.020	-.779***			
Model 2					.623	.621
FLR	-.498	.020	-.777***			
ADA	-.001	.000	-.129***			
Model 3					.642	.639
FLR	-.500	.019	-.780***			
ADA	-.001	.000	-.160***			
Disability Ratio	.425	.093	.141***			
Model 4					.645	.638
FLR	-.494	.020	-.771***			
ADA	-.001	.000	-.166***			
Disability Ratio	.430	.093	.142***			
80% or greater and 79-40%	-2.277	1.752	-.042			
79-40%	-1 .624	1.239	-.047			
79-40% and 39% or less	-.972	1.533	-.022			
39% or less	-1 .752	1.661	-.037			
Bimodal	.335	1.493	-.007			

*** p = .000, **p <.01, *p <.05

Table 23

Multiple Linear Regression with Stepwise Comparison for the Elementary MAP - Communication Arts (IEP Subgroup) 2010

	B	*SE*	*Beta*	*T*	R^2	ΔR^2
Model 1					.364	.363
FLR	-.354	.024	-.604***			
Model 2					.406	.403
FLR	-.364	.023	-.621***			
Disability Ratio	.609	.118	.205***			
Model 3					.418	.407
FLR	-.365	.024	-.623***			
Disability Ratio	.615	.119	.207***			
80% or greater and 79-40%	-4.320	2.581	-.069			
79-40%	-2.608	1.384	-.086			
79-40% and 39% or less	-1.614	1.898	-.037			
39% or less	1.719	2.156	.034			
Bimodal	-1.192	1.931	-.027			

*** p = .000, ** p <.01, * p <.05

Table 24

Multiple Linear Regression with Stepwise Comparison for the Elementary MAP - Communication Arts (Non-IEP Subgroup) 2010

	B	*SE*	*Beta*	*T*	R^2	ΔR^2
Model 1					.676	.676
FLR	-.523	.019	-.822***			
Model 2					.691	.698
FLR	-.512	.018	-.820***			
ADA	-.001	.000	-.119***			
Model 3					.698	.692
FLR	-.514	.019	-.810***			
ADA	-.001	.000	-.131***			
80% or greater and 79-40%	-2.230	2.027	-.033			
79-40%	-.873	1.112	-.026			
79-40% and 39% or less	-1.487	1.485	-.031			
39% or less	2.367	1.680	.043			
Bimodal	2.168	1.502	.045			

*** $p = .000$, ** $p < .01$, * $p < .05$

Table 25

Multiple Linear Regression with Stepwise Comparison for the Elementary MAP - Mathematics (IEP Subgroup) 2009

	B	*SE*	*Beta*	*T*	R^2	ΔR^2
Model 1					.288	.286
FLR	-.344	.027	-.537***			
Model 2					.311	.307
FLR	-.347	.027	-.541***			
Disability Ratio	.455	.125	.150***			
Model 3					.318	.313
FLR	-.346	.026	-.540***			
Disability Ratio	.513	.128	.169***			
ADA	-.001	.000	-.088*			
Model 4					.365	.352
FLR	-.343	.027	-.534***			
Disability Ratio	.521	.124	.172***			
ADA	-.001	.000	-.149**			
80% or greater and 79-40%	-7.536	2.344	-.139**			
79-40%	-7.916	1.657	-.230***			
79-40% and 39% or less	-1.234	2.052	-.027			
39% or less	-1.617	2.223	-.034			
Bimodal	-1.802	1.998	-.040			

*** p = .000, **p <.01, *p <.05

Table 26

Multiple Linear Regression with Stepwise Comparison for the Elementary MAP - Mathematics (Non-IEP Subgroup) 2009

	B	*SE*	*Beta*	*T*	R^2	ΔR^2
Model 1					.564	.563
FLR	-.532	.023	-.751***			
Model 2					.601	.599
FLR	-.529	.022	-.748***			
ADA	-.002	.000	-.191***			
Model 3					.608	.605
FLR	-.531	.022	-.750***			
ADA	-.002	.000	-.210***			
Disability Ratio	.295	.107	.088**			
Model 4					.618	.611
FLR	-.522	.023	-.738***			
ADA	-.002	.000	-.230***			
Disability Ratio	.303	.106	.091**			
80% or greater and 79-40%	-3.480	2.006	-.058			
79-40%	-4.279	1.418	-.113**			
79-40% and 39% or less	-1.341	1.755	-.027			
39% or less	-2.717	1.902	-.052			
Bimodal	-1.611	1.709	-.033			

*** $p = .000$, ** $p < .01$, * $p < .05$

Table 27

Multiple Linear Regression with Stepwise Comparison for the Elementary MAP - Mathematics (IEP Subgroup) 2010

	B	*SE*	*Beta*	*T*	R^2	ΔR^2
Model 1					.294	.292
FLR	-.356	.028	-.542***			
Model 2					.320	.316
FLR	-.365	.028	-.556***			
Disability Ratio	.541	.142	.163***			
Model 3					.332	.319
FLR	-.364	.029	-.555***			
Disability Ratio	.535	.143	.161***			
80% or greater and 79-40%	-3.211	3.097	-.046			
79-40%	-2.310	1.660	-.068			
79-40% and 39% or less	-1.033	2.276	-.021			
39% or less	3.642	2.586	.064			
Bimodal	.057	2.316	.001			

*** p = .000, ** p <.01, * p <.05

Table 28

Multiple Linear Regression with Stepwise Comparison for the Elementary MAP - Mathematics (Non-IEP Subgroup) 2010

	B	*SE*	*Beta*	*T*	R^2	ΔR^2
Model 1					.532	.531
FLR	-.493	.024	-.730***			
Model 2					.563	.561
FLR	-.491	.023	-.725***			
ADA	-.002	.000	-.176***			
Model 3					.572	.569
FLR	-.487	.023	-.721***			
ADA	-.002	.000	-.206***			
Student Teacher Ratio	-.650	.228	-.101**			
Model 4					.578	.569
FLR	-.482	.024	-.712***			
ADA	-.002	.000	-.216***			
Student Teacher Ratio	-.618	.231	-.096**			
80% or greater and 79-40%	-1.202	2.560	-.017			
79-40%	-1.039	1.404	-.030			
79-40% and 39% or less	-.253	1.886	-.005			
39% or less	2.440	2.118	.042			
Bimodal	2.211	1.892	.044			

*** $p = .000$, ** $p < .01$, * $p < .05$

Table 29

Multiple Linear Regression with Stepwise Comparison for change between 2009 and 2010 on the Elementary MAP- Communication Arts (IEP Subgroup)

	B	*SE*	*Beta*	*T*	R^2	ΔR^2
Model 1					.042	.038
ADA	2.205	.655	.205**			
Model 2					.051	.028
ADA	2.380	.684	.222**			
80% or greater and 79-40%	-2.331	4.806	-.032			
79-40%	1.592	3.067	.037			
79-40% and 39% or less	4.367	4.305	.068			
39% or less	.422	4.676	.006			
Bimodal	3.749	3.885	.065			

*** p = .000, ** p <.01, * p <.05

Table 30

Multiple Linear Regression with Stepwise Comparison for change between 2009 and 2010 on the Elementary MAP- Communication Arts (Non-IEP Subgroup)

	B	*SE*	*Beta*	*T*	R^2	ΔR^2
Model 1					.048	.045
ADA	.588	.163	.220***			
Model 2					.055	.033
ADA	.580	.170	.216**			
80% or greater and79-40%	.650	1.196	.035			
79-40%	-.356	.763	-.033			
79-40% and 39% or less	.765	1.071	.048			
39% or less	-.073	1.164	-.004			
Bimodal	-.536	.967	-.037			

*** p = .000, ** p <.01, * p <.05

Table 31

Multiple Linear Regression with Stepwise Comparison for change between 2009 and 2010 on the Elementary MAP- Mathematics (IEP Subgroup)

	B	*SE*	*Beta*	*T*	R^2	ΔR^2
Model 1					.028	.024
FRL	-.514	.188	-.168**			
Model 2					.051	.043
FRL	-.492	.186	-.161**			
ADA	1.457	.591	.150*			
Model 2					.062	.036
FRL	-.490	.191	-.160*			
ADA	1.542	.618	.159*			
80% or greater and 79-40%	.093	4.345	.001			
79-40%	-.056	2.766	-.001			
79-40% and 39% or less	5.699	3.894	.098			
39% or less	-.693	4.281	-.011			
Bimodal	2.802	3.500	.054			

*** p = .000, **p <.01, *p <.05

Table 32

Multiple Linear Regression with Stepwise Comparison for change between 2009 and 2010 on the Elementary MAP- Mathematics (Non-IEP Subgroup)

	B	*SE*	*Beta*	*T*	R^2	ΔR^2
Model 1					.034	.031
FRL	-.199	.066	-.185**			
Model 2					.049	.026
FRL	-.217	.067	-.202**			
80% or greater and 79-40%	-.762	1.532	-.033			
79-40%	-.860	.955	-.063			
79-40% and 39% or less	-.859	1.351	-.042			
39% or less	-2.717	1.486	-.121			
Bimodal	-1.326	1.232	-.072			

*** p = .000, ** p <.01, * p <.05

Table 33

Multiple Linear Regression with Stepwise Comparison for change between 2008 and 2010 on the Elementary MAP- Communication Arts (IEP Subgroup)

	B	*SE*	*Beta*	*T*	R^2	ΔR^2
Model 1					.017	.014
FRL	-.394	.184	-.132*			
Model 2					.028	.005
FRL	-.414	.186	-.139*			
80% or greater and 79-40%	.280	5.860	.003			
79-40%	-1.271	3.715	-.025			
79-40% and 39% or less	3.046	5.087	.041			
39% or less	-2.076	4.781	-.030			
Bimodal	-5.457	4.391	-.088			

*** p = .000, **p <.01, *p <.05

Table 34

Multiple Linear Regression with Stepwise Comparison for change between 2008 and 2010 on the Elementary MAP- Communication Arts (Non-IEP Subgroup)

	B	*SE*	*Beta*	*T*	R^2	ΔR^2
Model 1					.033	.029
Disability Ratio	.108	.036	.182**			
Model 2					.058	.051
Disability Ratio	.102	.036	.173**			
ADA	.327	.125	.159**			
Model 3					.087	.061
Disability Ratio	.113	.037	.191**			
ADA	.314	.126	.153*			
80% or greater and 79-40%	.603	1.543	.025			
79-40%	-.523	.982	-.039			
79-40% and 39% or less	-2.496	1.349	-.124			
39% or less	1.544	1.253	.083			
Bimodal	-.859	1.151	-.052			

*** p = .000, **p <.01, *p <.05

Table 35

Multiple Linear Regression with Stepwise Comparison for change between 2008 and 2010 on the Elementary MAP- Mathematics (IEP Subgroup)

	B	*SE*	*Beta*	*T*	R^2	ΔR^2
Model 1					.019	.016
ADA	1.011	.448	.139*			
Model 2					.040	.033
ADA	1.059	.444	.146*			
FRL	-.411	.173	-.145*			
Model 3					.066	.040
ADA	1.037	.448	.143*			
FRL	-.441	.174	-.155*			
80% or greater and 79-40%	.785	5.491	.009			
79-40%	-1.331	3.517	-.028			
79-40% and 39% or less	3.101	4.768	.044			
39% or less	-1.787	4.481	-.027			
Bimodal	-9.009	4.117	-.153*			

*** p = .000, **p <.01, *p <.05

Table 36

Multiple Linear Regression with Stepwise Comparison for change between 2008 and 2010 on the Elementary MAP- Mathematics (Non-IEP Subgroup)

	B	*SE*	*Beta*	*T*	R^2	ΔR^2
Model 1					.039	.035
Student Teacher Ratio	-.256	.079	-.198**			
Model 2					.063	.040
Student Teacher Ratio	-.263	.79	-.204**			
80% or greater and 79-40%	-1.343	2.032	-.043			
79-40%	.438	1.1285	.025			
79-40% and 39% or less	3.125	1.766	.119			
39% or less	-.595	1.655	-.024			
Bimodal	-1.324	1.519	-.061			

*** $p = .000$, ** $p < .01$, * $p < .05$

Table 37

Mean and Standard Deviations for the Six Categories of Participation for IEP and Non-IEP subgroups, Percent Scoring Advanced or Proficient- Communication Arts 2009

	Com Arts IEP		Com Art Non-IEP	
	Mean	Standard Deviation	Mean	Standard Deviation
80% or greater	30.8	14.8	57.9	15.8
80% or greater and 79-40%	26.6	11.0	55.4	10.8
79-40%	23.3	9.8	53.5	10.0
79-40% and 39% or less	25.1	10.6	48.9	13.9
39% or less	25.6	16.6	44.5	17.6
Bimodal	29.8	17.2	54.7	16.9

Table 38

Tukey HSD Communication Arts 2009 (IEP subgroup)

	80% or greater	80% and 79-40%	79-40%	79-40% and 39%	39% or less	Bimodal
80% or greater	X		**			
80% or greater and 79-	X	X				
79-40%	X	X	X			
79-40% and 39% or less	X	X	X	X		
39% or less	X	X	X	X	X	
Bimodal	X	X	X	X	X	X

*** $p = .000$, ** $p < .01$, * $p < .05$

Table 39

Tukey HSD Communication Arts 2009 (Non-IEP subgroup)

	80% or greater	80% and 79-40%	79-40%	79-40% and 39%	39% or less	Bimodal
80% or greater	X			**	***	
80% or greater and 79-40%	X	X			*	
79-40%	X	X	X		**	
79-40% and 39% or less	X	X	X	X		
39% or less	X	X	X	X	X	**
Bimodal	X	X	X	X	X	X

*** p = .000, **p <.01, *p <.05

Table 40

One-Way ANOVA Communication Arts 2009 (IEP and Non-IEP subgroup)

		df	*F*
IEP	Between Groups	5	4.190**
	Within Groups	399	
	Total	404	
Non-IEP	Between Groups	5	7.043***
	Within Groups	399	
	Total	404	

*** p = .000, **p <.01, *p <.05

Table 41

Mean and Standard Deviations for the Six Categories of Participation for IEP and Non-IEP subgroups, Percent Scoring Advanced or Proficient- Math 2009

	Math IEP		Math Non-IEP	
	Mean	Standard Deviation	Mean	Standard Deviation
80% or greater	36.2	16.3	59.1	16.7
80% or greater and 79-40%	28.6	10.7	55.5	10.3
79-40%	26.6	11.3	52.6	11.7
79-40% and 39% or less	29.6	11.4	49.2	15.5
39% or less	26.5	16.7	43.1	20.3
Bimodal	32.0	17.3	53.6	18.8

Table 42

Tukey HSD Math 2009 (IEP subgroup)

	80% or greater	80% and 79-40%	79-40%	79-40% and 39%	39% or less	Bimodal
80% or greater	X		***		**	
80% or greater and 79-40%	X	X				
79-40%	X	X	X			
79-40% and 39% or less	X	X	X	X		
39% or less	X	X	X	X	X	
Bimodal	X	X	X	X	X	X

*** $p = .000$, ** $p < .01$, * $p < .05$

Table 43

Tukey HSD Math 2009 (Non-IEP subgroup)

	80% or greater	80% and 79-40%	79-40%	79-40% and 39%	39% or less	Bimodal
80% or greater	X		*	**	***	
80% or greater and 79-40%	X	X			**	
79-40%	X	X	X		*	
79-40% and 39% or less	X	X	X	X		
39% or less	X	X	X	X	X	*
Bimodal	X	X	X	X	X	X

*** p = .000, ** p <.01, * p <.05

Table 44

One-Way ANOVA Math 2009(IEP and Non-IEP subgroup)

		df	*F*
IEP	Between Groups	5	6.367***
	Within Groups	399	
	Total	404	
Non-IEP	Between Groups	5	7.957***
	Within Groups	399	
	Total	404	

*** p = .000, ** p <.01, * p <.05

Table 45

Mean and Standard Deviations for the Six Categories of Participation for IEP and Non-IEP subgroups, Percent Scoring Advanced or Proficient- Communication Arts 2010

	Com Arts IEP		Com Art Non-IEP	
	Mean	Standard Deviation	Mean	Standard Deviation
80% or greater	30.4	16.3	56.1	16.6
80% or greater and 79-40%	28.5	13.4	58.0	10.3
79-40%	27.0	10.3	54.5	12.0
79-40% and 39% or less	27.0	12.8	51.7	17.6
39% or less	30.5	13.1	54.9	16.8
Bimodal	35.5	14.6	66.2	12.1

Table 46

Tukey HSD Communication Arts 2010 (IEP subgroup)

	80% or greater	80% and 79-40%	79-40%	79-40% and 39%	39% or less	Bimodal
80% or greater	X					
80% or greater and 79-40%	X	X				
79-40%	X	X	X			**
79-40% and 39% or less	X	X	X	X		
39% or less	X	X	X	X	X	
Bimodal	X	X	X	X	X	X

*** $p = .000$, ** $p < .01$, * $p < .05$

Table 47

Tukey HSD Communication Arts 2010 (Non-IEP subgroup)

	80% or greater	80% and 79-40%	79-40%	79-40% and 39%	39% or less	Bimodal
80% or greater	X					**
80% or greater and 79-40%	X	X				
79-40%	X	X	X			***
79-40% and 39% or less	X	X	X	X		***
39% or less	X	X	X	X	X	**
Bimodal	X	X	X	X	X	X

*** p = .000, **p <.01, *p <.05

Table 48

One-Way ANOVA Communication Arts 2010

		df	*F*
IEP	Between Groups	5	2.826*
	Within Groups	375	
	Total	380	
Non-IEP	Between Groups	5	5.183***
	Within Groups	375	
	Total	380	

*** p = .000, **p <.01, *p <.05

Table 49

Mean and Standard Deviations for the Six Categories of Participation for IEP and Non-IEP subgroups, Percent Scoring Advanced or Proficient- Math 2010

	Math IEP		Math Non-IEP	
	Mean	Standard Deviation	Mean	Standard Deviation
80% or greater	34.5	19.3	56.2	18.0
80% or greater and 79-40%	33.6	12.1	59.0	10.7
79-40%	31.3	11.2	54.9	12.3
79-40% and 39% or less	31.6	15.7	52.9	19.3
39% or less	36.3	11.0	55.0	17.4
Bimodal	40.7	15.4	66.2	13.3

Table 50

Tukey HSD Math 2010 (IEP subgroup)

	80% or greater	80% and 79-40%	79-40%	79-40% and 39%	39% or less	Bimodal
80% or greater	X					
80% or greater and 79-40%	X	X				
79-40%	X	X	X			*
79-40% and 39% or less	X	X	X	X		
39% or less	X	X	X	X	X	
Bimodal	X	X	X	X	X	X

*** $p = .000$, ** $p < .01$, * $p < .05$

Table 51

Tukey HSD Math 2010 (Non-IEP subgroup)

	80% or greater	80% and 79-40%	79-40%	79-40% and 39%	39% or less	Bimodal
80% or greater	X					**
80% or greater and 79-40%	X	X				
79-40%	X	X	X			**
79-40% and 39% or less	X	X	X	X		**
39% or less	X	X	X	X	X	*
Bimodal	X	X	X	X	X	X

*** $p = .000$, ** $p < .01$, * $p < .05$

Table 52

One-Way ANOVA Math 2010

		df	*F*
IEP	Between Groups	5	2.686*
	Within Groups	375	
	Total	380	
Non-IEP	Between Groups	5	4.112**
	Within Groups	375	
	Total	380	

*** $p = .000$, ** $p < .01$, * $p < .05$