

A Study of School-Wide Attendance Rates in Relation to Student Achievement on Missouri
Assessment Program Test Scores for Mathematics and ELA in Rural Missouri Middle
Schools from 2010 to 2014

By

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ABSTRACT

This study was done to determine if there was a significant relationship between the percentage of overall school-wide attendance rates from 2010 to 2014 and overall student achievement on the Missouri Assessment Program (MAP) in 7th and 8th grade Mathematics and English Language Arts (ELA) from 2010 to 2014 in Missouri rural middle schools. This study specifically analyzed data from 145 rural middle schools in Missouri on the percentages of students scoring in the bottom two levels of the MAP scoring system (basic and below basic) and the top two levels of the MAP scoring system (proficient and advanced) to determine if there was a statistically significant relationship between 7th and 8th grade MAP score percentages and school-wide attendance rate percentages. This study was primarily an attempt to acquire a greater understanding of how school-wide attendance impacts student achievement. The researchers used EZAnalyze® software to perform fourteen Pearson Product Moment Coefficient of correlation tests to determine if any relationships existed between attendance and MAP scores. The findings from this study determined there was not a statistically significant relationship between school-wide attendance and the bottom two and top two levels of the scoring system for MAP scores in 7th and 8th grade Math and ELA from 2010 to 2014 in Missouri rural middle schools. Although this study did not determine a statistically significant relationship between school-wide attendance and student achievement, the literature included in this study indicates a need for educators to further explore the impact of student attendance on student achievement and school accountability.

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CHAPTER ONE

INTRODUCTION TO THE STUDY

Background

There is typically little debate over the impact of students' attendance on their academic performance. Multiple studies, over the past several decades, concluded that individual student attendance rates and individual student academic progress, as tracked by state standardized tests, are heavily correlated across all grade levels and across all subjects (Blad, 2014; Gottfried, 2010; Mikus, 2013; Roby, 2004; Schooley, 2007). Innovative policies, programs, incentives, and punishments have all been implemented in the hope of ultimately raising school attendance and have been met with varying success. But due to the contextual and demographic differences between school districts, extrapolation of these programs is not always plausible (Epstein, 2002). The contextual differences between districts are most evident when examining rural school districts in comparison to their non-rural counterparts.

Rural schools across the country face a unique set of challenges beyond attendance which include scheduling, resource allocation, transportation, declining enrollment, student demographics, student home life, and student socioeconomic status (Augustine-Shaw, 2015; Casto & Steinhauer, 2012; Clarke & Wildy, 2011; Delaney, 2016; Fishman, 2015). Across the country, rural school districts are also forced to compete academically with much larger and more heavily funded districts, yet they are still held to the same high expectations. In Missouri, rural schools are forced to compete with the farming season, poverty, and frequently changing assessment standards as well as the other routine issues that most school districts contend with annually. The proven lack of resources in rural school districts in comparison to their suburban

rivals, however, is the most troubling issue and responding to these challenges effectively is an even more daunting task (Fishman, 2015). Consequently, administrators in rural schools are continually searching for appropriate policies and programs which are highly conducive to student success, some of which are focused on attendance (Brown, 2012; Grady & Montalvo, 2012; Harmon et. al, 2007).

Standardized test scores, which were implemented as early as the 1930s, have continually been utilized to both gauge academic progress and also hold public schools accountable for their students' learning. The data collected from these tests essentially measure both individual and school-wide academic achievement. However, the implementation and execution of these assessments have both evolved over the twentieth and twenty-first century. The assessments now cover multiple subjects and span essentially every grade level starting in third grade in the public school system (Edwards, 2006; William, 2010). Due to the escalating academic expectations of public schools in the United States, the schools have recently become more criticized than they have in the past. Fortunately, though, standardized tests prove to be a very effective tool for statistical analysis and allow researchers to properly analyze current programs and policies employed in public schools for their effectiveness.

This study specifically analyzed the percentages of students scoring in the bottom two and top two levels of the scoring system on the 7th and 8th grade Missouri Assessment Program (MAP) tests in Mathematics and English Language Arts (ELA) with respect to school-wide attendance rates in rural middle schools across the state of Missouri from 2010 to 2014. This study then ultimately attempted to determine if there was a statistical correlation between the previously mentioned percentages of students scoring in the bottom two and top two levels of the

MAP test and the school-wide attendance rates in order to better understand the impact of individual absences on the academic progress of the school as a whole.

Conceptual Underpinnings

Since increased individual student absences could perhaps impact the progress of a class as a whole, it is imperative to consider the effect of poor school-wide attendance on overall school performance. However, studies to date that have been conducted which analyze total school attendance rates versus overall school performance exclusively have seen minimal success (Mikus, 2013; Gottfried, 2010). These studies routinely claim that the variance in the reasons why students are absent may have a confounding effect on their analysis as well. Thus, more research needs to be conducted in regard to school-wide attendance percentages versus student performance as student expectations continue to escalate and standardized testing methods continue to evolve. This continued research can then perhaps be used to justify or inspire policies and programs which aim to maximize school-wide academic success.

Encouraging consistent student enrollment, specifically in an age of dwindling resources for rural school districts and increased academic expectations, cannot be understated and is a proper first step in closing the achievement gap between rural and non-rural schools (Williams, 2011; Willard, 2013). However, rural schools face slightly different family dynamics and different absence reasons than schools in urban or suburban districts. Due to high variance in the reasons why students are absent, school-wide attendance percentages are often difficult to track and measure in regard to their impact on student achievement. Furthermore, much of the current research done on attendance is not specific to rural schools (Blad, 2014; California School Board Association, 2012). Thus, the current research studies and their conclusions concerning student attendance are not always applicable to rural school districts, especially if rural school districts

are not included in the research samples of those studies. Lastly, very few studies have analyzed the correlation between rural school-wide attendance rates and their corresponding school-wide academic performance (Gottfried, 2010). In order to adequately combat some of the issues currently facing rural schools and fill these holes in the research, more studies need to be conducted in this particular field.

School-wide academic performance in Missouri public schools, rural or not, is measured by the Missouri Assessment Program (MAP). The MAP continues to grow and change from its inception in 1993 and looks very different from its original form. Currently, the MAP is responsible for multiple tests in Mathematics, English Language Arts, Science, and other subjects from 3rd grade up to 12th grade. The scores recorded by the MAP have routinely been used as a measuring stick to hold Missouri public schools accountable and to analyze the effectiveness of school policies and programs. Unfortunately, research has shown that rural schools have performed statistically worse in 4th grade Mathematics, 4th grade English Language Arts, 8th grade Mathematics, and 8th grade English Language Arts when compared to suburban schools even though differences in variables such as attendance are minimal. However, this research found no statistical significance when comparing rural and urban schools in the same subjects (DESE, 2015; Willis, 2013; Wittenzellner, 2015). Thus, research concerning school-wide attendance in rural schools, specifically in relation to the MAP performance, needs to be completed in order to adequately measure the correlation between the two variables. Since subjects such as Mathematics and English Language Arts vary so drastically, the research concerning MAP performance should be separated by subject as well.

Statement of the Problem

Individual attendance has consistently been shown to be statistically correlated to individual academic performance regardless of the setting of the school district (California School Board Association, 2012). The academic demands of American public schools continue to rise as well, which further accentuates the impact of attendance on student success. However, mounting individual attendance issues might also impact the progress of the class as a whole due to the demands on the teacher to ensure all students are learning. Also, there is a lack of statistically significant research focusing on the relationship between school-wide attendance rates and academic performance. More specifically, there is a general lack of information about 7th and 8th grade MAP performance on the Mathematics and English Language Arts exams in relation to school-wide attendance rates in rural middle schools in Missouri.

Missouri is littered with 520 rural school districts across the state, which serve 44.9 percent of Missouri public school students every day (NCES, 2013). Thus, maximizing their potential by utilizing current research is vital to the continual growth of these school districts. In response, this study will attempt to identify any correlations between school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the scoring system on the 7th and 8th grade MAP tests in Mathematics and English Language Arts in Missouri rural middle schools.

Purpose of the Study

The researchers' purpose of the study was to fill the gap in knowledge concerning school-wide attendance percentages and its connection to academic performance. In order to specifically produce more research on rural school-wide attendance rates and its relation to 7th and 8th grade

MAP performance, the researchers proposed an investigation between middle school attendance rates and the percentages of students scoring in the top and bottom two categories of the MAP assessment in order to measure their relationship. To do this, the study sought to measure the statistical correlation between the percentages of students in the top two tiers of MAP performance, defined as Proficient and Advanced, in Mathematics and English Language Arts and the overall middle school attendance percentages. The study also sought to measure the statistical correlation between the percentages of students in the bottom two tiers of MAP performance, defined as Basic and Below Basic, in Mathematics and English Language Arts and the overall middle school attendance percentages.

Research Questions

The researchers were interested in determining the intensity of the relationship between school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the scoring system on the 7th and 8th grade MAP tests in Mathematics and ELA in rural middle schools. In order to fully investigate this topic, the researchers developed four specific research questions which are listed below.

RQ1: Is there a relationship between school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the scoring system on the 7th grade MAP test in Mathematics in rural middle schools?

RQ2: Is there a relationship between school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the scoring system on the 8th grade MAP test in Mathematics in rural middle schools?

RQ3: Is there a relationship between school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the scoring system on the 7th grade MAP test in English Language Arts in rural middle schools?

RQ4: Is there a relationship between school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the scoring system on the 8th grade MAP test in English Language Arts in rural middle schools?

Null Hypotheses

H₀1: There is no relationship between school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the scoring system on the 7th grade MAP test in Mathematics in rural middle schools.

H₀2: There is no relationship between school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the scoring system on the 8th grade MAP test in Mathematics in rural middle schools.

H₀3: There is no relationship between school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the scoring system on the 7th grade MAP test in English Language Arts in rural middle schools.

H₀4: There is no relationship between school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the scoring system on the 8th grade MAP test in English Language Arts in rural middle schools.

Anticipated Benefits of the Study

This study has many potential benefits by providing additional research on rural school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the scoring system on the 7th and 8th grade MAP test in Mathematics and English Language Arts. This study specifically determined if a statistically significant relationship existed between the two previously mentioned data sets in rural Missouri middle schools. Administrators perhaps could use this information to inform their decisions on attendance policies and disciplinary procedures. Furthermore, administrators could possibly discuss this information with parents in order to persuade them to limit the absences of their children. Teachers perhaps could also use this information to inform decisions about student absence procedures and discourage individual absences in order to reduce the potential negative effect on other present classmates.

Limitations

The study was limited by the fact that all of the data collected was only from Missouri public schools. Furthermore, the data was collected exclusively from the Missouri's Department of Elementary and Secondary Education (DESE) database, so any gaps in their data sets were carried over into the study. The data collected from DESE was also sifted in order to match rural middle school attendance percentages with their corresponding percentages of students scoring in the bottom two and top two levels of the scoring system on the 7th and 8th grade MAP test in Mathematics and English Language Arts from 2010 to 2014, which ultimately forced the researchers to remove hundreds of data points that did not match up correctly. Since the researchers only used the data points that were the most polished and readily able to be matched, the samples of scoring percentages and attendance percentages could not be considered random.

By utilizing attendance percentages though, the researchers also had to work against the natural negative skew associated with attendance percentages due to their cap of 100 percent and their mean of 89.4 percent. In addition, outliers in the data sets were included in the study, but, due to the high number of data points, these outliers would have produced a negligible to minimal impact on the statistical analysis. Perhaps the biggest limitation though was that the researchers could not separate the building-wide attendance percentages into separate grade attendance percentages to use for further comparison against their specific grade's scoring percentages.

Delimitations

The researchers intentionally collected data sets exclusively from Missouri's DESE website in order to limit the study to a single state. Additionally, they pared down the data sets, which included thousands of schools across the state of Missouri, to include only rural middle schools which included the percentages of students scoring in the bottom two and top two levels of the scoring system on the 7th and 8th grade MAP test in Mathematics and English Language Arts. Only the MAP scoring percentages which were paired with their corresponding attendance percentages for each year between 2010 and 2014 were then kept and used for analysis. Finally, since a true MAP index score was either unreliable or not readily available for all of the schools that were collected, the percentages of students who scored in the top two tiers and the percentages of students who scored in the bottom two tiers of the MAP Mathematics and English Language Arts exams were the only data used for comparison in the study.

Definition of Terms

School-Wide Attendance Percentage – The average percentage of each student's yearly attendance percentage within a single building, which often includes multiple grade levels (DESE, 2015).

English Language Arts (ELA) – The subjects that aims to develop a student’s mastery of written and oral language, such as reading, spelling, literature, and composition.

Missouri Assessment Program (MAP) – In this study, the MAP refers specifically to the annual norm-referenced tests which are used to monitor and measure student learning in both Mathematics and ELA in both 7th and 8th grade (DESE, 2015).

Missouri Department of Elementary and Secondary Education (DESE) – The administrative agency for K-12 public schools in the state of Missouri.

Middle School – A building which primarily serves the 6th, 7th, and 8th grades exclusively.

Non-rural – An area that is either in close proximity to an urban center or is largely populated.

Percentage of Students in Bottom Two Tiers – The percentages of students participating in a given MAP test who score in either the Basic or Below Basic categories (DESE, 2015).

Percentage of Students in Top Two Tiers - The percentages of students participating in a given MAP test who score in either the Proficient or Advanced categories (DESE, 2015).

Rural – An area with a small population size and that is also geographically isolated from any urban centers.

Summary

Current research states that individual student attendance rates and individual student academic progress are statistically correlated, that rural schools face hardships which are foreign to suburban and urban school districts, and that rural schools generally underperform on state standardized testing in comparison to their suburban peers. However, there is limited research on

the correlation between school-wide attendance percentages and school-wide academic performance in general, and even less research of this kind which examine rural school districts or middle schools exclusively. So, in order to fill this void, this study analyzed the correlation between the school-wide average attendance percentages and the school-wide percentages of students scoring in the bottom two and the top two MAP placement levels in both Mathematics and English Language Arts in rural middle schools between 2010 and 2014.

This chapter provided a brief overview of the issues, stated the problem which the study is meant to address, illustrated the research questions and null hypotheses, discussed the limitations and delimitations of the study, and then previewed the potential benefits which could be gained from this study as well. The next chapter will provide an in-depth review of the appropriate and relevant literature related to the pillars of attendance, rural school districts, and standardized testing. This will be followed by a thorough explanation of the experimental study and the results of the statistical testing.

CHAPTER 2

REVIEW OF THE LITERATURE

Overview

There have been several studies and educational conversations in Missouri surrounding the urban and suburban school districts in and around the Kansas City and St. Louis metropolitan areas. While these larger school districts are often the focus of educational conversations about improvement and reform, rural school districts are responsible for educating a large portion of Missouri students. According to McShane (2016), “In 2013–2014 there were 863,163 total students in Missouri in 520 school districts, making rural students 44.9 percent of all students and rural districts 88 percent of all districts” (p. 3). The array of challenges faced by rural schools and the vast number of rural students in Missouri suggest a need to focus more educational conversations and studies on improving the education in rural schools.

The Department of Elementary and Secondary Education (DESE) determines a portion of school funding based on the average daily attendance (ADA) for schools, impacting the amount of funding and resources districts receive. In addition, researchers such as Gottfried (2010) and Roby (2004) show a significant relationship between school attendance and student achievement. Although there have been many studies on the relationship between attendance and student achievement, there have been limited studies in this area focused on rural schools. The following information is a review of the literature focusing on the pillars of this study.

The pillars of this study include research on the challenges and dynamics of rural school districts in relation to attendance in public schools and the impact on standardized testing. The researchers conducted a review of the relevant literature in order to shed light on the different

variables impacting this study as they attempted to determine the relationship between school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the scoring system on the 7th grade and 8th grade MAP test in Mathematics and English Language Arts in rural middle schools from 2010 to 2014.

Public Schools and Attendance

Although many rural school districts are finding innovative ways to address the needs of their schools, teachers, students, and families, rural schools continue to face a host of challenges. According to McShane (2016), “These include recruiting quality teachers, securing adequate funding for their schools, and providing the varied course offerings that their students will need to succeed in the 21st century” (p. 1). In addition, rural school districts may struggle to find certified teachers who are qualified for every subject area. Also, there can be an absence of quality supports for developing teachers and programs which increase teacher turnover (McShane, 2016). According to The National Forum of Educational Statistics (2009), one of the strongest school-related determinants of student success is teacher effectiveness. Unfortunately, absences hinder even the best teacher’s ability to provide adequate learning opportunities (National, 2009). Districts that attempt to formulate strategies and implement programs that encourage attendance are taking positive steps toward improving student and district outcomes. According to Chang & Romero (2008), “Attendance is higher when schools provide a rich, engaging learning experience, have stable, experienced and skilled teachers, and actively engage parents in their children’s education” (p. 4)

According to Fishman (2015), hiring, mentoring, and retaining district leadership can also be challenging. Rural settings can present unique experiences for school administrators. According to Augustine-Shaw (2015), school leadership plays a major role in establishing a clear

focus for teachers on curriculum, instruction, and assessment. In addition, leadership plays an important role in understanding both rural communities and the key factors necessary for implementing organizational change within a district or school (Fishman, 2015). Lamkin (2006) writes, “the premise that the role of rural school superintendents has become increasingly difficult may be the direct result of increased demands and decreased assistance” (p. 22). Effective leadership is critical to the development and implementation of programs that support initiatives, such as student achievement and increased attendance.

Gottfried’s (2010) study on attendance showed a relationship between academic outcomes and school attendance. The study contributed to the literature by showing a relationship between higher school attendance and higher achievement scores in terms of both standardized tests and GPA. Although Gottfried’s (2010) study indicated a relationship between attendance and achievement, his research was able to track individual student attendance over multiple years rather than tracking school-wide attendance for districts. In addition, Gottfried (2010) cites research from Balfanz & Byrnes in a 2006 study on attendance writing, “students with better attendance records are cited as having stronger test performance” (p. 435). According to statistical data taken from the National Assessment of Educational Progress (NAEP) and Attendance Works, the one in five students who missed three days of school before they took the NAEP assessment had lower achievement scores (Attendance Works, 2014). The data indicated if students continued this behavior, they would miss up to an entire month of school and, in many cases, achieve at skill levels one to two years below their peers who show greater school attendance (Attendance Works, 2014).

Reasons for Absences

A research study done by the Northwest Regional Educational Laboratory in 2004 used student surveys on student perceptions as a way to understand why students were not coming to school. The findings indicate that students' school perceptions, which included perceptions of parents' control, parental discipline, perceived family conflict, social competence in class, and students' academic self-concept are all established risk factors related to non-attendance (Railsback, 2004). Other common reasons cited for non-attendance were that students viewed classes as boring, irrelevant, and a waste of time (Railsback, 2004; McConnell & Kubina, 2014). In addition, students who were frequently absent stated that they felt that they did not have positive relationships with teachers or other students, were suspended too often, did not feel safe at school, or were failing classes. Also, some students found classes not challenging enough or felt as though they could not work and go to school at the same time (Railsback, 2004; McConnell & Kubina, 2014).

With attendance rates being a primary concern for schools for both funding and achievement, extensive research has been attempted in this area to determine the reasons for absences and how to address absenteeism. If the researchers accept the research, which states that attendance heavily impacts student achievement, it would be imperative that the research considered populations which are more susceptible to poor attendance. Therefore, understanding the challenges of rural communities might be beneficial to studying educational attendance and considering possible strategies for its improvement.

In many rural communities, there is a lack of mobility and opportunity, which has led to a loss of jobs (McShane, 2016). Unemployment has led to increased substance abuse and health issues, and also a decline in stability, creating a negative impact on the well-being of families

and students (McShane, 2016). According to Fishman (2015), “overall, one in four rural children live in poverty, and of the 50 U.S. counties with the highest child-poverty rates, 48 are rural”(p. 1). Students in poverty, rural districts, inner city districts, and minorities are at risk of increased absenteeism (Rees, 2014). According to Rees (2014), “Students in rural communities are likelier than their peers to live in poverty and only 27 percent go on to college” (p. 1). In statistically lower socio-economic groups, which would apply to rural and inner-city school districts, the attendance rates have been shown to have a more significant impact on achievement scores (Attendance Works, 2014). Chronic absenteeism in Missouri includes those students missing more than 10 percent of his or her school year. According to a study of six states done by Johns Hopkins University, absenteeism occurs at rates three to four times higher in high-poverty areas where students may miss 30 to 40 days of school a year (Cutillo, 2013).

According to Railsback (2004), research on truancy prevention typically views attendance concerns as being the result of a “functional problem,” which include factors, such as self-motivation, peer relations, social skills, discipline, mental health, poverty, and substance abuse. “In the mid-2000s, rural 8th graders were 59 percent more likely than peers in large cities to use methamphetamines and 104 percent more likely to use any amphetamine, according to the National Center on Addiction and Substance Abuse” (p. 8). According to McConnell & Kubina (2014), “School attendance is critical for American students. When students are not in school, they are missing out on their education and potentially engaging in risky behaviors. On any given day, 10 percent of public school students are absent from school.” (p. 249).

According to Chang & Romero (2008), some additional causal relationships from their research about absenteeism included lack of school communication with parents on the importance of attendance, the failure to engage parents and create active partnerships, the failure

to monitor absences, violence in schools, and not offering high-quality, engaging educational experiences. In addition, some causal factors for families impacting student attendance included lack of housing, lack of transportation, lack of resources, and other multiple family risks (Chang & Romero, 2008). During an educational forum in 2013, Missouri rural administrators confirmed that transportation was challenging for many rural public school districts. “Superintendent Richard Sullivan, superintendent of East Carter county Schools, noted his district spans 240 square miles, includes a lot of rural poverty and, consequently, many families for whom transportation often times is an obstacle in getting children to school” (Willard, 2013).

Encouraging Student Attendance

Schools across the country have implemented policies and programs to address the non-attendance issue. Student attendance is a complex issue and there is no simple solution. Every student, family, school district, and surrounding community are unique and multifaceted. Although some school attendance programs have shown an improvement in student attendance, they do not always meet the needs of individual students. According to Chang & Romero, (2008), “High overall school-wide attendance rates can easily mask significant numbers of chronically absent students” (p. 4). This is especially significant when comparing attendance research focused on individual students or schools to the limited research on school-wide attendance.

Epstein & Sheldon (2002) write, “To prevent and correct serious attendance problems, schools need to change the way they are structured, improve the quality of courses, and intensify interpersonal relationships between students and teachers” (p. 309). Many researchers conclude that improving attendance starts with a comprehensive plan focusing on students, family, and community (Chang & Romero, 2008; Epstein & Sheldon, 2002; Railsback, 2004). The National

Center for Educational Statistics (2009) provides information and resources to encourage educators to use detailed attendance data, based on multiple variables, in order to implement changes that can be used as a model for other educational organizations to solve their attendance problems.

Schools which approach improving attendance with activities that involve students, families, and communities should rely on positive activities rather than negative or punishing activities and should also sustain a focus on their efforts over time (Epstein & Sheldon, 2002). According to Chang & Romero (2008), “Strong, ongoing partnerships among schools, families, and community agencies which implement comprehensive approaches over time are critical to ensuring all children have the opportunity to attend school every day” (p. 5). In addition, “Because family dynamics are important existing factors resulting in absenteeism, and because most times students are reinforced by activities in the home, family support could be a logically supportive system in improving attendance” (Chang & Romero, 2008, p. 250). As this study focused on determining the relationship between attendance rates and the percentages of students scoring in the bottom two and top two levels of the Missouri Assessment Program (MAP) in rural schools, further literature was reviewed on standardized tests and Missouri’s school accountability system.

Public School Accountability and MAP

Decreased financial assistance and limited funding sources can be a problem for some public school districts. Because rural districts generate less revenue from taxes and local funds, rural districts rely more heavily on state dollars than urban districts. One study done in Colorado focused on the disadvantages rural school districts face under the Elementary and Secondary Education Act (ESEA). The background research of this study points out the problems in the

design of ESEA in regard to funding and the issues facing rural education (Yettick et. al, 2014). According to the U.S. Department of Education (2015), the Rural Education Achievement Program (REAP) is designed to assist rural schools in meeting their critical needs and continually works to combat their other challenges in education. Currently, there are two REAP initiatives linked to helping rural districts use federal grant resources through the Small Rural School Achievement Program (SRSA) and the Rural and Low-Income School Program (Rural, 2015-2016).

Considering the historical guidelines for the No Child Left Behind Act (NCLB) and the current need for districts to meet Annual Yearly Progress (AYP), attendance continues to be an area of focus for school districts. This is especially true when considering state funding sources are tied to attendance and there may be a lack of local resources present to assist public school districts. A lack of funding can then be directly related to school-wide attendance as schools struggle to provide adequate resources, supports for families and students, sound programming, and high-quality education that keeps students in school and engaged. Epstein & Sheldon (2002) write, "School funding is often at least partially dependent on the number of students who regularly attend. Fewer pupils mean fewer resources for educational programs" (p. 308-309). Although district budgets and funding are impacted by attendance, student achievement is also a primary concern when considering school accountability and the Missouri School Improvement Program (MSIP 5).

Standardized Tests

Standardized testing has been around for a long time as a way to compare a student's knowledge and skills to other students at the same grade level or of the same age. Through these standardized tests, inferences can be made about students' relative strengths and weaknesses

across subject areas (Pophan, 1999). Also, some researchers agree that standardized tests can be a way to compare school performance, measure student achievement, and hold teachers accountable (Baker et. al, 2010; Do Standardized Tests, 2016; Pophan, 1999; William, 2010). According to Edwards (2006), standardized tests can close achievement gaps, help maintain high expectations, and provide a focus on specific goals for students to strive toward.

Although standardized tests provide useful information, some researchers believe standardized achievement tests should not be the only means used to evaluate student achievement or the quality of education (Baker et.al, 2010; Pophan, 1999; William, 2010). According to Pophan (1999), students have an enormous amount of knowledge and skills that cannot be accurately measured by a standardized test. Furthermore, the quality of an education can be impacted by a number of factors including previous teachers, quality of curriculum, class size, scheduling practices, attendance, school conditions, and out-of-school learning experiences (Baker et. al, 2010). In addition, test scores can also be influenced by family conditions including resources, health, mobility, and neighborhood peers (Baker et. al, 2010).

Other arguments against standardized testing include: teaching to the test, narrowing the curriculum, excessive testing, and a lack of demonstrating innovation and critical thinking skills necessary for deeper learning (Do Standardized Tests, 2016; Edwards, 2006; Pophan, 1999). Because of the multiple variables surrounding standardized testing, there is a lot of controversy about the use of standardized testing as a single way to determine student achievement, teacher effectiveness, and education quality. Regardless of the various arguments for or against standardized testing, the state of Missouri uses standardized testing, along with attendance, as a form of school accountability and as a measurement for state funding.

MSIP 5

The Missouri School Improvement Plan (MSIP) 5 is the state's school accountability system for reviewing and accrediting public school districts in Missouri (MSIP, 2016). The MSIP 5 process reviews both the performance standards and the resource and process standards identified for improvement for all Missouri schools to ensure student success. Performance standards contain data from the following areas: MAP scores, advanced coursework, and various college readiness and career readiness assessments like ACT, SAT, Compass, ASVAB, and Work Keys. Each of those assessments is given a numerical value and added to the values for college placements, career education placement, graduation rates, attendance rates, and subgroup achievement (MSIP, 2016). Although all standards within MSIP 5 are connected, for the purpose of this study, information surrounding academic achievement, school-wide attendance, and the connection between the two is the focus.

MAP

A significant portion of achievement data is calculated by the Missouri Assessment Program (MAP) for 3rd through 8th grade in the content areas of English Language Arts (ELA) and Mathematics. In addition to those two content areas, Science is tested at the 5th and 8th grade levels. The End of Course Exams (EOC) are also given to students in grades 6th through 11th who enrolled in select high school level courses. If a student at the middle school level is enrolled in a high school level course, then they would be exempt from the MAP in that content area and instead take the EOC. Students attaining proper academic achievement is defined by DESE as those students who meet or exceed the state standard or make progress over time. In addition, the student attendance standard states that districts are to ensure that all students regularly attend school. Missouri's school attendance expectation is that 90 percent or more of

students will be in attendance 90 percent or more of the time. School districts attempt to meet all the requirements of MSIP 5 as it is important for accreditation, school improvement, and funding (LEA Guide, 2015-2016).

Summary

Railsback (2004) writes, “It is well known that a most important key to children’s academic success is having them attend school on a regular basis” (p. 3). According to Railsback (2004), poor attendance is an indicator of student disengagement and a lack of motivation and also implies that there exist more complex issues with a schools’ culture and structure. Gottfried (2010) writes, “There are both sociological and economic concerns associated with students having low attendance rates” (p. 435) and according to Blazer & Romanik (2009), students’ socioeconomic status has a strong relationship to their level of academic achievement.

There are several variables that contribute to the success of any given student in school. Teacher training and experience, relevant and rigorous curriculum, and family support are a few areas that should be addressed in order to keep students engaged and in school. However, current research clearly states which variables tend to be the biggest predictors of student achievement. Among these variables is low socio-economic status, which can impact many rural communities. The residual effects of poverty tend to compound their negative impacts on a student’s success. As researchers look to develop policies that will assist in improving attendance, they may be a little short-sighted in their approach. However, they must continue to address the whole child as they deal with developing programs and policies that provide services to assist students in public schools, thus creating opportunities for greater achievement.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

Problem and Purposes Overview

There exists a large amount of research validating the relationship between individual attendance and individual academic performance, but due to the lack of research on school-wide attendance percentages and their relationship to academic performance, in addition to the absence of such research related specifically to rural school districts, the researchers sought to add to the body of knowledge surrounding school-wide attendance percentages in rural school districts (California School Board Association, 2012). This study specifically investigated the relationship between school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the 7th grade and 8th grade Mathematics and ELA MAP tests from 2010 to 2014. The researchers hoped to prove that a statistical relationship existed between their attendance and MAP data sets using EZAnalyze® software. All of the data for the study was collected from Missouri's Department of Elementary and Secondary Education website.

Research Design

This research took place in rural middle schools across the state of Missouri whose school-wide attendance percentages and percentages of students scoring in the bottom two and top levels of the 7th grade and 8th grade Mathematics and ELA MAP tests from 2010 to 2014 were listed on the Missouri DESE website. The one-hundred and forty-five schools used in the data sets were selected strictly out of convenience and data-accessibility. In order to find the relationship between the attendance variable and the MAP score variables, the researchers used

EZAnalyze® software to perform fourteen Pearson Product Moment Coefficient of correlation tests, all using an alpha level of 0.05 as a comparison to the measured p-values. If a calculated p-value was less than the indicated alpha level, the researchers rejected the null hypothesis for that particular test. If a calculated p-value was more than the indicated alpha level though, the researchers did not reject the null hypothesis for that particular test. The Product Moment Coefficient of correlation test was the most applicable statistical test for this study because the researchers wanted to investigate the relationship between their variables.

Variables Used in the Study

The researchers used three variables in order to answer the four researcher questions in this study: the year-long average school-wide attendance percentage, the percentages of students scoring in the bottom two levels of the 7th grade and 8th grade Mathematics and ELA MAP tests, and the percentages of students scoring in the top two levels of the 7th grade and 8th grade Mathematics and ELA MAP tests. For each research question there were two analyses that were conducted. The first analysis was of the relationship between the school-wide attendance percentage for each rural middle school for each year between 2010 and 2014 and the percentages of students scoring in the bottom two levels on the 7th grade and 8th grade Mathematics and ELA MAP tests for each year between 2010 and 2014. Then, the second analysis was of the relationship between the school-wide attendance percentage for each rural middle school for each year between 2010 and 2014 and the percentages of students scoring in the top two levels on the 7th grade and 8th grade Mathematics and ELA MAP tests for each year between 2010 and 2014. After the initial data analysis, the researchers decided to conduct additional testing on the data by pooling the 7th and 8th grade percentages of students scoring in the bottom two and top two levels of the MAP tests, yet still separating the data by Mathematics

and ELA. The researchers then finally concluded their testing by pooling the Mathematics and ELA percentages together as well.

Research Questions

RQ1: Is there a relationship between school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the scoring system on the 7th grade MAP test in Mathematics in rural middle schools?

RQ2: Is there a relationship between school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the scoring system on the 8th grade MAP test in Mathematics in rural middle schools?

RQ3: Is there a relationship between school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the scoring system on the 7th grade MAP test in English Language Arts in rural middle schools?

RQ4: Is there a relationship between school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the scoring system on the 8th grade MAP test in English Language Arts in rural middle schools?

Null Hypotheses

H₀1: There is no relationship between school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the scoring system on the 7th grade MAP test in Mathematics in rural middle schools.

H₀₂: There is no relationship between school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the scoring system on the 8th grade MAP test in Mathematics in rural middle schools.

H₀₃: There is no relationship between school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the scoring system on the 7th grade MAP test in English Language Arts in rural middle schools.

H₀₄: There is no relationship between school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the scoring system on the 8th grade MAP test in English Language Arts in rural middle schools.

Study Group

The study group was made up of rural middle schools in the state of Missouri whose school-wide attendance percentages and percentages of students scoring in the bottom two and top two levels of the 7th grade and 8th grade Mathematics and ELA MAP tests from 2010 to 2014 were listed on the Missouri DESE website. Any rural middle school in Missouri which was missing either an attendance or MAP data point between those years was not selected. After filtering the raw data, there was a total of one-hundred and forty-five rural middle schools included in the study.

Data Collection

The researchers utilized archived data on school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the 7th grade and 8th grade Mathematics and ELA MAP tests from the years 2010 to 2014. This data was collected using Missouri's Department of Elementary and Secondary Education (DESE) website. The

researchers initially filtered the raw data sheets found on the DESE website to strictly include only rural middle schools. The researchers then paired each school-wide attendance percentage with its corresponding percentages of students scoring in the bottom two and top two levels of the 7th grade and 8th grade Mathematics and ELA MAP tests. Data relating to individual students were not collected during this study.

Data Analysis

Analysis for this study was conducted using EZAnalyze® software and Microsoft Excel® spreadsheet software. The data gathered from Missouri's DESE website was stored in a single spreadsheet and was separated by subject area and grade level. Descriptive statistics for each data set were calculated first, but every additional statistical calculation was performed using a Pearson Product Moment Coefficient of correlation test to identify the level of relationship between the rural middle school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the MAP spectrum on the 7th grade and 8th grade MAP tests in both Mathematics and English Language Arts. For every test, the researchers used an alpha level of 0.05 for comparison to the calculated p-value in order to identify the statistical significance of the relationship between the chosen data sets for that particular test. Furthermore, the researchers also calculated an r-squared value for each data set comparison in order to indicate what percentage of variance in one data set was accounted for by the variance in the other. Ultimately, the researchers conducted fourteen statistical tests: six comparing school-wide attendance percentages to the percentages of students scoring in the bottom two and top two levels of the 7th grade and 8th grade Mathematics MAP tests, six comparing school-wide attendance percentages to the percentages of students scoring in the bottom two and top two levels of the 7th grade and 8th grade ELA MAP tests, and two comparing

school-wide attendance percentages to the percentages of students scoring in the bottom two and top two levels of the 7th grade and 8th grade Mathematics and ELA MAP tests combined.

Summary

This study determined if a significant statistical relationship existed between school-wide attendance percentages in rural Missouri middle schools between 2010 and 2014 and the percentages of students scoring in the bottom two and top two levels of the MAP spectrum on the 7th grade and 8th grade MAP tests in both Mathematics and English Language Arts. The data analysis was broken down by grade level and subject area. In the following chapter, the researchers will discuss the tests specified in this section and then report the findings.

CHAPTER FOUR

FINDINGS AND RESULTS FROM DATA ANALYSIS

Overview

This study investigated the relationship between rural middle school attendance percentages between 2010 and 2014 and the percentages of students scoring in the bottom two and top two levels of the MAP spectrum on the 7th grade and 8th grade MAP tests in both Mathematics and English Language Arts between 2010 and 2014. The researchers initially conducted eight separate statistical tests in order to determine if a relationship existed between school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the MAP spectrum on the 7th grade and 8th grade MAP tests in both Mathematics and English Language Arts in rural middle schools. Six additional tests also were run by the researchers in order to measure the relationships between the previously mentioned data sets when the percentages of students scoring in the bottom two and top two levels of the MAP spectrum on the 7th grade and 8th grade MAP tests in both Mathematics and English Language Arts were pooled in different ways. EZAnalyze® software was used to compare the measured p-values with a set significance level of five percent, $\alpha = 0.05$. Finding these values determined whether a relationship between the data sets was statistically significant or not. The r-squared values were also calculated and were then used to determine what percentage of the variance in school-wide attendance percentages was accounted for by the variance in the percentages of students scoring in the bottom two and top two levels of the MAP spectrum on the 7th grade and 8th grade MAP tests in both Mathematics and English Language Arts in rural middle schools as well.

Descriptive Statistics

Prior to engaging in the statistical significance testing between school-wide attendance rates and the percentages of students scoring in the bottom two and top two levels of the MAP spectrum on the 7th grade and 8th grade MAP tests in both Mathematics and English Language Arts in rural school districts, the researchers calculated some descriptive statistics from the data sets. The mean, median, and standard deviation were calculated for the pooled data sets of school-wide attendance percentages, the percentages of students scoring in the bottom two levels of the MAP spectrum in 7th and 8th grade on the Math and ELA MAP tests, and the percentages of students scoring in the top two levels of the MAP spectrum in 7th and 8th grade on the Math and ELA MAP tests.

Each data set contained 2900 measurements, which confirmed the strength of the correlation coefficients measured later in the study. As shown in Table 1, the mean of the pooled data set of school-wide attendance percentages was 89.051 percent, the mean of the percentages of students scoring in the bottom two levels of the MAP spectrum in 7th and 8th grade on the Math and ELA MAP tests was 46.550 percent, and the mean of the percentages of students scoring in the top two levels of the MAP spectrum in 7th and 8th grade on the Math and ELA MAP tests was 53.451 percent. Table 1 also shows that the median of the pooled data set of school-wide attendance percentages was 89.400 percent, the median of the percentages of students scoring in the bottom two levels of the MAP spectrum in 7th and 8th grade on the Math and ELA MAP tests was 45.800 percent, and the median of the percentages of students scoring in the top two levels of the MAP spectrum in 7th and 8th grade on the Math and ELA MAP tests was 54.200 percent. Finally, Table 1 displays that the standard deviation of the pooled data set of school-wide attendance percentages was 4.62 percent, the standard deviation of the percentages

of students scoring in the bottom two levels of the MAP spectrum in 7th and 8th grade on the Math and ELA MAP tests was 11.583 percent, and the standard deviation of the percentages of students scoring in the top two levels of the MAP spectrum in 7th and 8th grade on the Math and ELA MAP tests was 11.583 percent.

Table 1: Descriptive Statistics for Attendance and MAP Percentage Data Sets

	Percent of Students Scoring in Bottom Two Levels on MAP	Percent of Students Scoring in Top Two Levels on MAP	School-Wide Attendance Percentage
N Valid:	2900	2900	2900
Mean:	46.550	53.451	89.051
Median:	45.800	54.200	89.400
Std. Dev:	11.583	11.583	4.620

Due to the small differences between the mean and the median of each data set, the researchers concluded that outliers in the data did not have an impact on the statistical analysis conducted later in the study. The small standard deviation of the school-wide attendance percentages also indicated to the researchers that nearly 95 percent of the data points were within 10 percentage points of the mean of 89.051 percent. Since the standard deviations of the percentages of students scoring in the bottom two and top two levels of the MAP spectrum on the 7th grade and 8th grade MAP tests in both Mathematics and English Language Arts data sets were an identical 11.583 percent, the researchers concluded that nearly 95 percent of the data points were within 25 percentage points of the means of 46.550 and 53.451 percent, respectively. These values were reassuring to the researchers because percentage-based data have a natural cap of 100 percent and school-based attendance data specifically has a natural negative skew since most schools have attendance rates over 80 percent.

Results from Research Question #1

The first question that the researchers sought to answer was, “Is there a relationship between school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the scoring system on the 7th grade MAP test in Mathematics in rural middle schools?” For the first question EZAnalyze® software was used to conduct two Pearson Product Moment Coefficient of correlation tests. The researchers compared the measured p-values with a set significance level of five percent, $\alpha = 0.05$.

As shown in Table 2, the observed p-values were $p = .435$ for the tests between school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the MAP spectrum on the 7th grade Math MAP test. Since they were more than the significance level of $\alpha=0.05$, the researchers did not reject the null hypothesis which stated that there was no statistically significant relationship between school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the MAP spectrum on the 7th grade Math MAP test. Thus, the relationship between these two data sets appeared to be statistically insignificant.

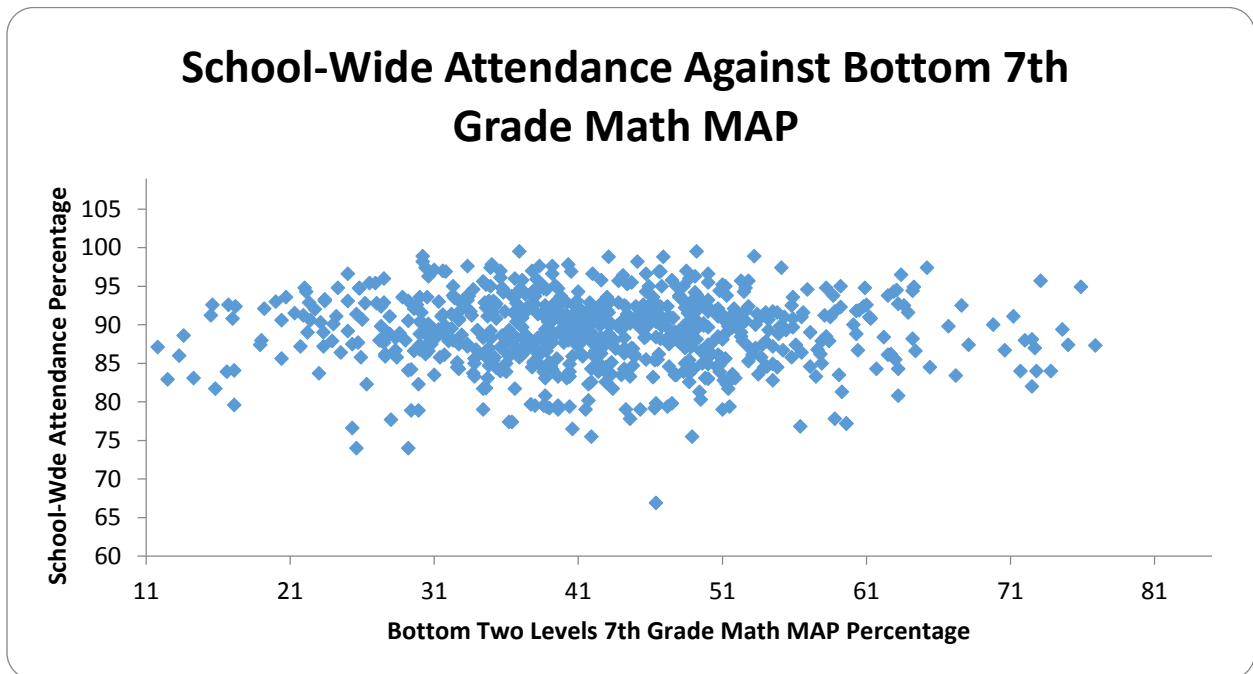
Also displayed in Table 2 were the correlation coefficients of 0.029. These correlational measurements between school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the MAP spectrum on the 7th grade Math MAP test were not statistically significant. The r-squared values also indicated that less than 3 percent of the variance in school-wide attendance percentages was accounted for by the variance in the percentages of students scoring in the bottom two and top two levels of the MAP spectrum on the 7th grade Math MAP test.

Table 2: Correlation Results Between Attendance and 7th Grade Math MAP

<i>School-Wide Attendance Compared to Bottom Two Levels 7th Grade Math MAP</i>		<i>School-Wide Attendance Compared to Top Two Levels 7th Grade Math MAP</i>	
Pearson		Pearson	
Correlation	-.029	Correlation	.029
N	725.000	N	725.000
P	.435	P	.435

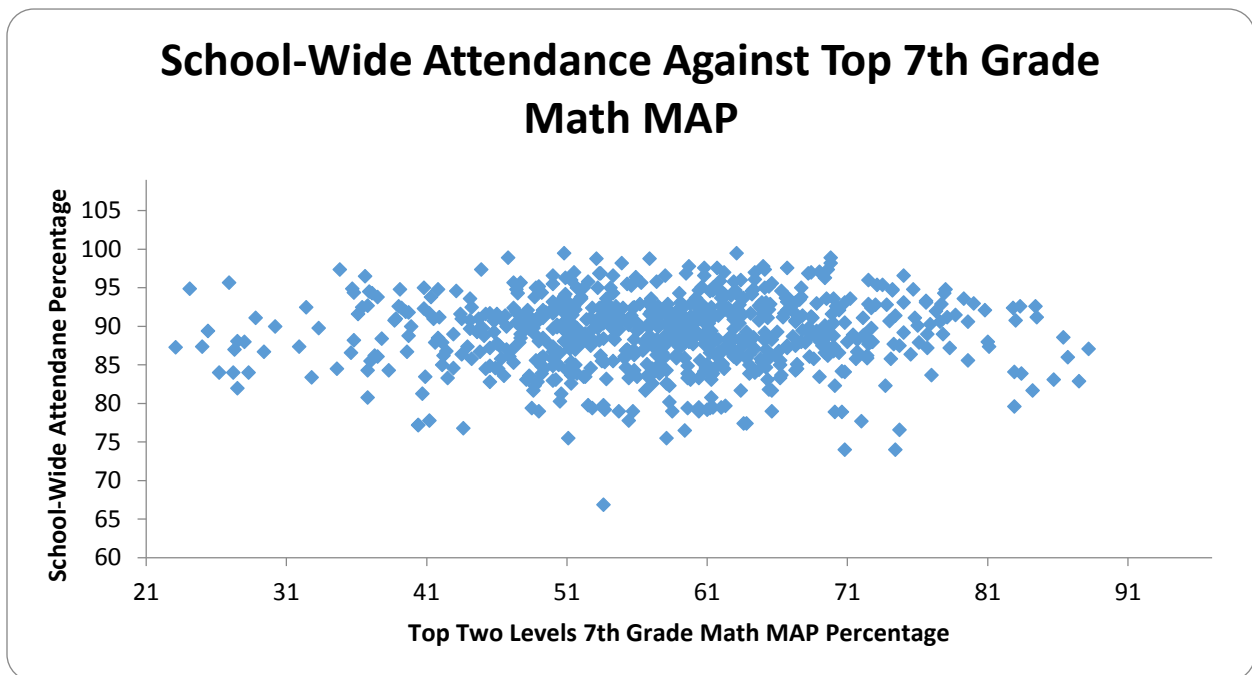
As shown in Figure 1, a scatterplot of the school-wide attendance percentages graphed against the percentages of students scoring the bottom two levels of the MAP spectrum on the 7th grade Math MAP test was created to illustrate their relationship visually.

Figure 1: Scatterplot of School-Wide Attendance Against Bottom 7th Grade Math MAP



As shown in Figure 2, a scatterplot of the school-wide attendance percentages graphed against the percentages of students scoring the top two levels of the MAP spectrum on the 7th grade Math MAP test was created to illustrate their relationship visually as well.

Figure 2: Scatterplot of School-Wide Attendance Against Top 7th Grade Math MAP



Results from Research Question #2

The second question that the researchers sought to answer was, “Is there a relationship between school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the scoring system on the 8th grade MAP test in Mathematics in rural middle schools?” For the second question EZAnalyze® software was used to conduct two Pearson Product Moment Coefficient of correlation tests. The researchers compared the measured p-values with a set significance level of five percent, $\alpha = 0.05$.

As shown in Table 3, the observed p-values were $p = .215$ for the tests between school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the MAP spectrum on the 8th grade Math MAP test. Since they were more than the significance level of $\alpha=0.05$, the researchers did not reject the null hypothesis which stated that there was no statistically significant relationship between school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the MAP spectrum on the 8th grade Math MAP test. Thus, the relationship between these two data sets appeared to be statistically insignificant.

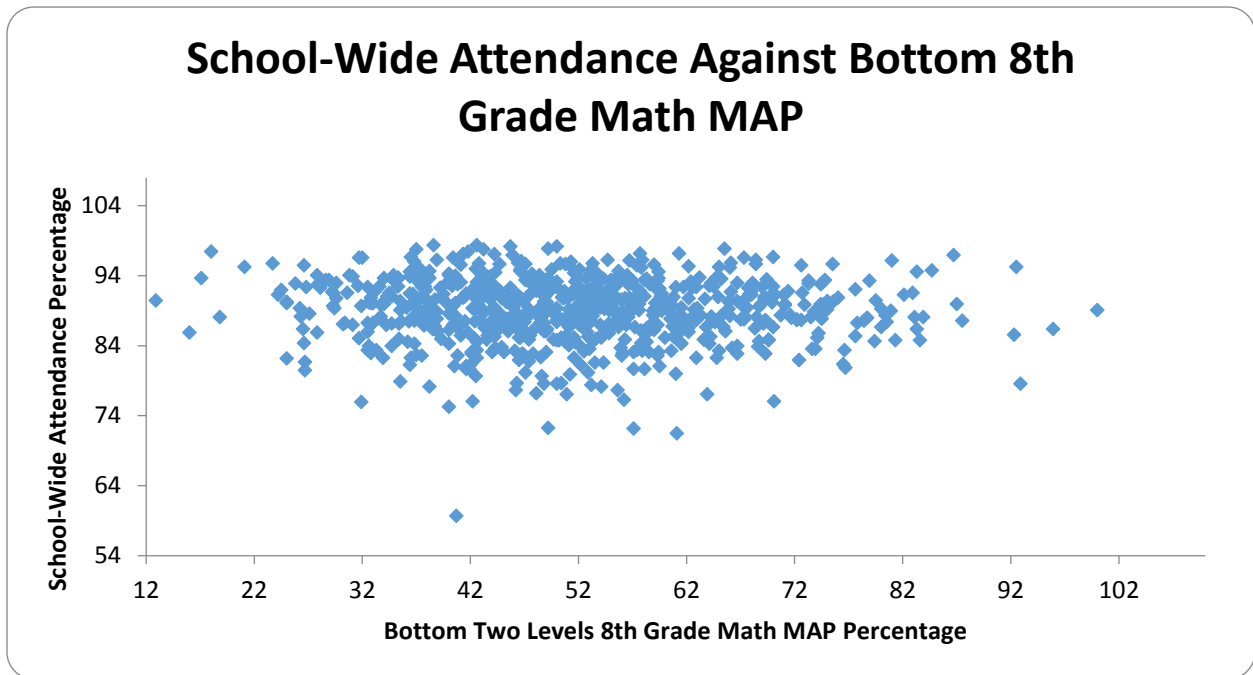
Also displayed in Table 3 were the correlation coefficients of 0.046. These correlational measurements between school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the MAP spectrum on the 8th grade Math MAP test were not statistically significant. The r-squared values also indicated that less than 5 percent of the variance in school-wide attendance percentages was accounted for by the variance in the percentages of students scoring in the bottom two and top two levels of the MAP spectrum on the 8th grade Math MAP test.

Table 3: Correlation Results Between Attendance and 8th Grade Math MAP

<i>School-Wide Attendance Compared to Bottom</i>		<i>School-Wide Attendance Compared to Top</i>	
<i>Two Levels 8th Grade Math MAP</i>		<i>Two Levels 8th Grade Math MAP</i>	
Pearson		Pearson	
Correlation	-.046	Correlation	.046
N	725.000	N	725.000
P	.214	P	.215

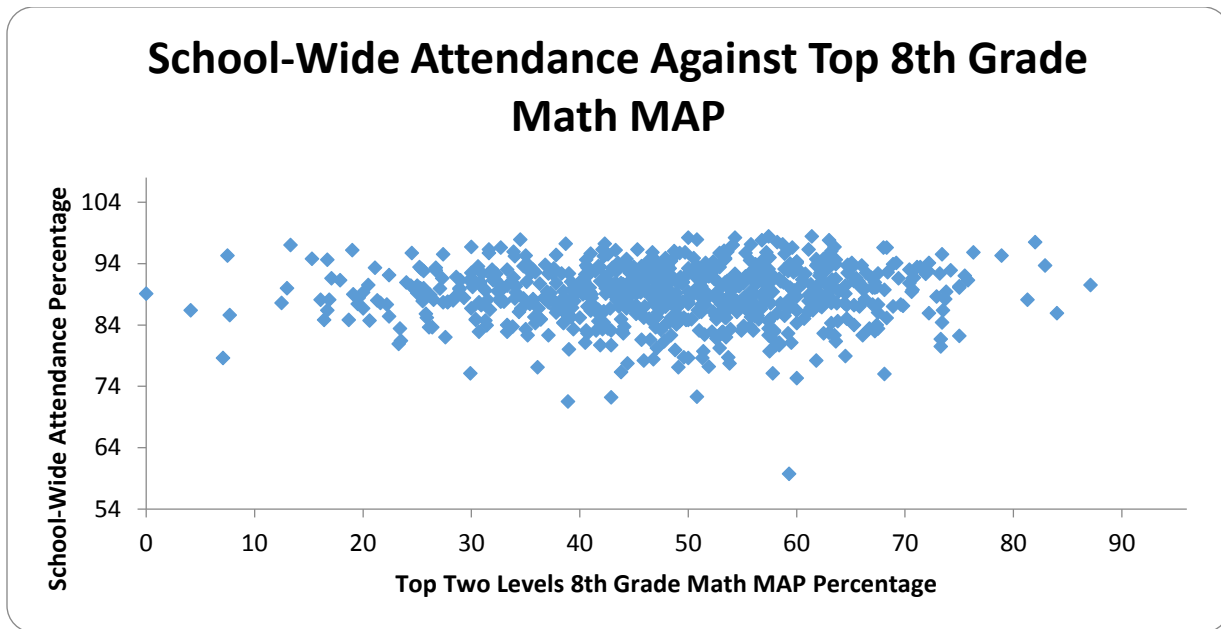
As shown in Figure 3, scatterplot of the school-wide attendance percentages graphed against the percentages of students scoring the bottom two levels of the MAP spectrum on the 8th grade Math MAP test was created to illustrate their relationship visually.

Figure 3: Scatterplot of School-Wide Attendance Against Bottom 8th Grade Math MAP



As shown in Figure 4, a scatterplot of the school-wide attendance percentage graphed against the percentage of students scoring the top two levels of the MAP spectrum on the 8th grade Math MAP test was created to illustrate their relationship visually as well.

Figure 4: Scatterplot of School-Wide Attendance Against Top 8th Grade Math MAP



Additional Analysis for Questions 1 and 2

Upon concluding their analysis of the first two research questions, the researchers sought to additionally analyze the pooled 7th and 8th grade Math MAP data as well. For this additional analysis, EZAnalyze® software was used to conduct two Pearson Product Moment Coefficient of correlation tests. The researchers compared the measured p-values with a set significance level of five percent, $\alpha = 0.05$.

Even though it was not listed as one of the original research questions and null hypotheses, as shown in Table 4, the observed p-values were $p = .133$ for the tests between school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the MAP spectrum on the 7th grade and 8th grade Math MAP tests. Since they were more than the significance level of $\alpha=0.05$, the researchers did not reject the null hypothesis which stated that there was no statistically significant relationship between school-

wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the MAP spectrum on the 7th grade and 8th grade Math MAP tests. Thus, the relationship between these two data sets appeared to be statistically insignificant.

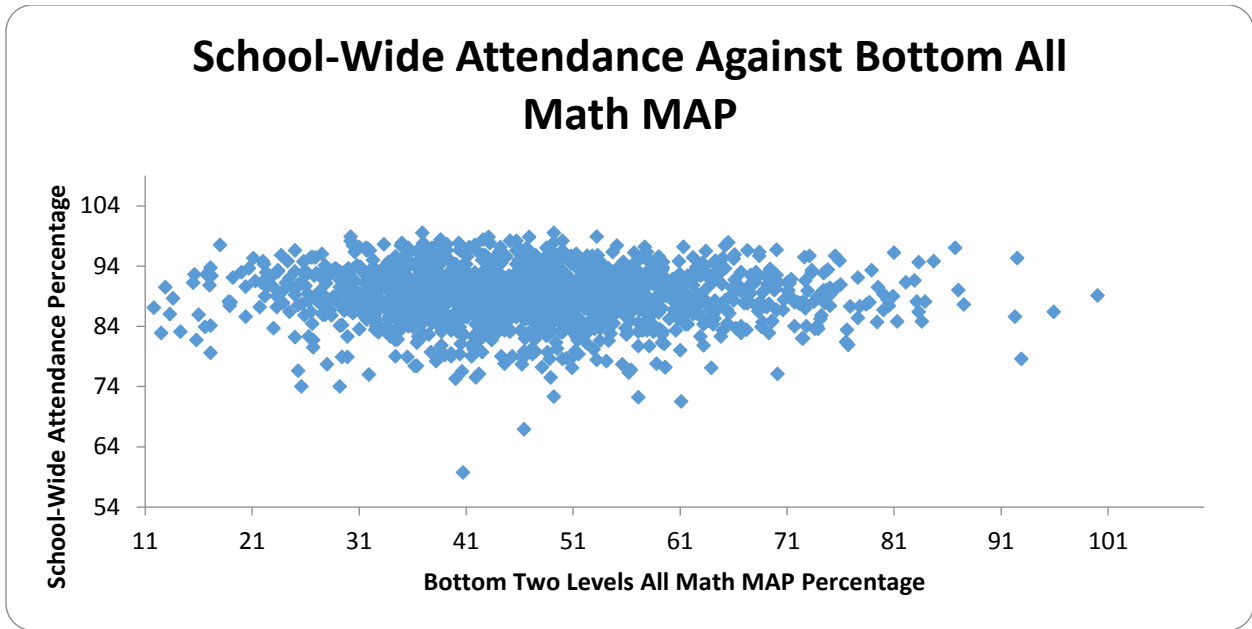
Also displayed in Table 4 were the correlation coefficients of -0.039 . These correlational measurements between school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the MAP spectrum on the 7th grade and 8th grade Math MAP tests were not statistically significant. The r-squared values also indicated that less than 4 percent of the variance in school-wide attendance percentages was accounted for by the variance in the percentages of students scoring in the bottom two and top two levels of the MAP spectrum on the 7th grade and 8th grade Math MAP tests.

Table 4: Correlation Results Between Attendance and All Math MAP

<i>School-Wide Attendance Compared to Bottom</i>		<i>School-Wide Attendance Compared to Top</i>	
<i>Two Levels All Math MAP</i>		<i>Two Levels All Math MAP</i>	
Pearson		Pearson	
Correlation	-.039	Correlation	.039
N	1450.000	N	1450.000
P	.133	P	.133

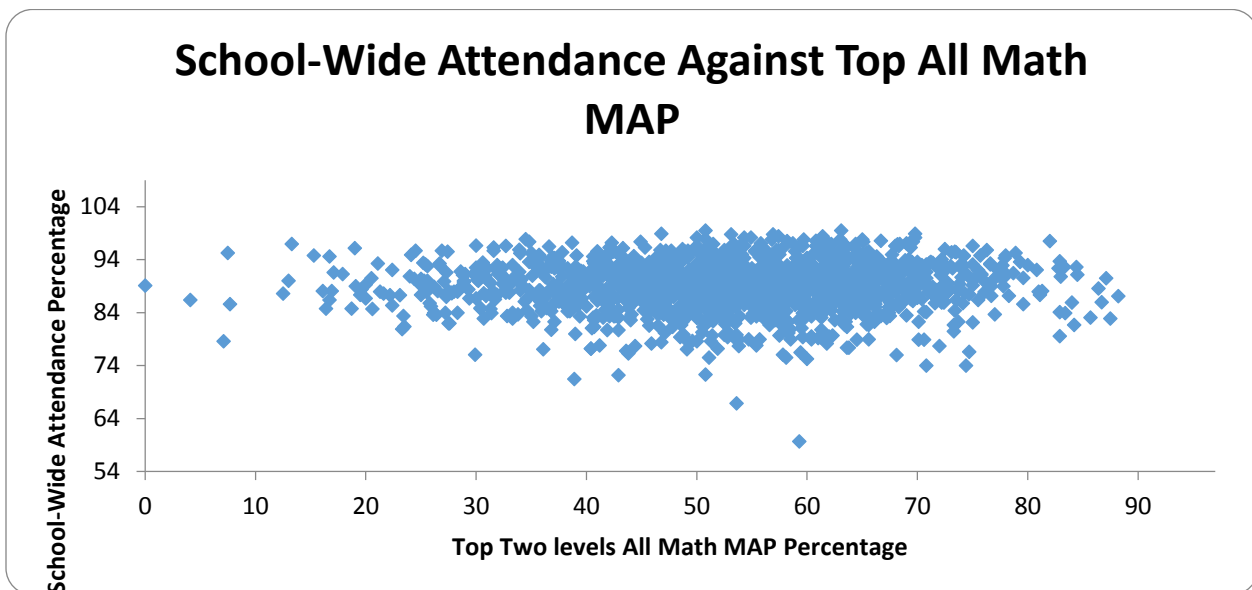
As shown in Figure 5, a scatterplot of the school-wide attendance percentages graphed against the percentages of students scoring the bottom two levels of the MAP spectrum on the 7th grade and 8th grade Math MAP test was created to illustrate their relationship visually.

Figure 5: Scatterplot of School-Wide Attendance Against Bottom All Math MAP



As shown in Figure 6, a scatterplot of the school-wide attendance percentages graphed against the percentages of students scoring the top two levels of the MAP spectrum on the 7th grade and 8th grade Math MAP test was created to illustrate their relationship visually as well.

Figure 6: Scatterplot of School-Wide Attendance Against Top All Math MAP



Results from Research Question #3

The third question that the researchers sought to answer was, “Is there a relationship between school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the scoring system on the 7th grade MAP test in English Language Arts in rural middle schools?” For the third question EZAnalyze® software was used to conduct two Pearson Product Moment Coefficient of correlation tests. The researchers compared the measured p-values with a set significance level of five percent, $\alpha = 0.05$.

As shown in Table 5, the observed p-values were $p = .291$ for the tests between school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the MAP spectrum on the 7th grade ELA MAP test. Since they were more than the significance level of $\alpha=0.05$, the researchers did not reject the null hypothesis which stated that there was no statistically significant relationship between school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the MAP spectrum on the 7th grade ELA MAP test. Thus, the relationship between these two data sets appeared to be statistically insignificant.

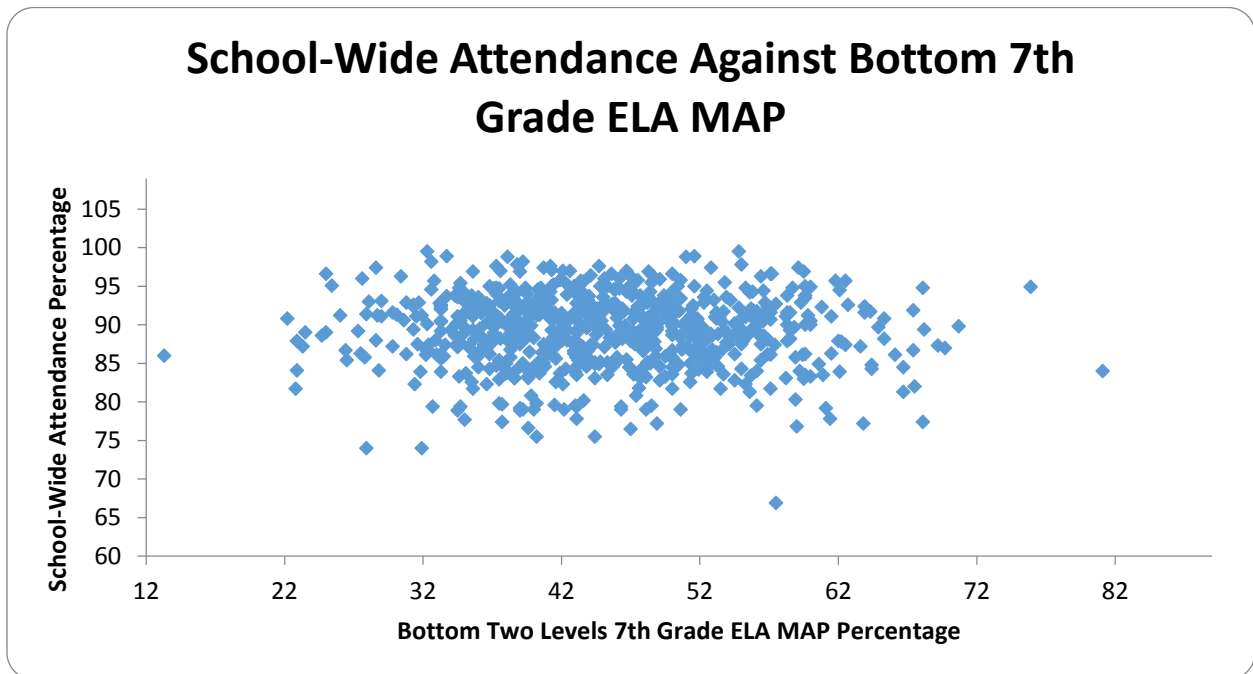
Also displayed in Table 5 were the correlation coefficients of -0.039 . These correlational measurements between school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the MAP spectrum on the 7th grade ELA MAP test were not statistically significant. The r-squared values also indicated that less than 4 percent of the variance in school-wide attendance percentages was accounted for by the variance in the percentages of students scoring in the bottom two and top two levels of the MAP spectrum on the 7th grade ELA MAP test.

Table 5: Correlation Results Between Attendance and 7th Grade ELA MAP

<i>School-Wide Attendance Compared to Bottom</i>		<i>School-Wide Attendance Compared to Top</i>	
<i>Two Levels 7th Grade ELA MAP</i>		<i>Two Levels 7th Grade ELA MAP</i>	
Pearson		Pearson	
Correlation	-.039	Correlation	.039
N	725.000	N	725.000
P	.291	P	.291

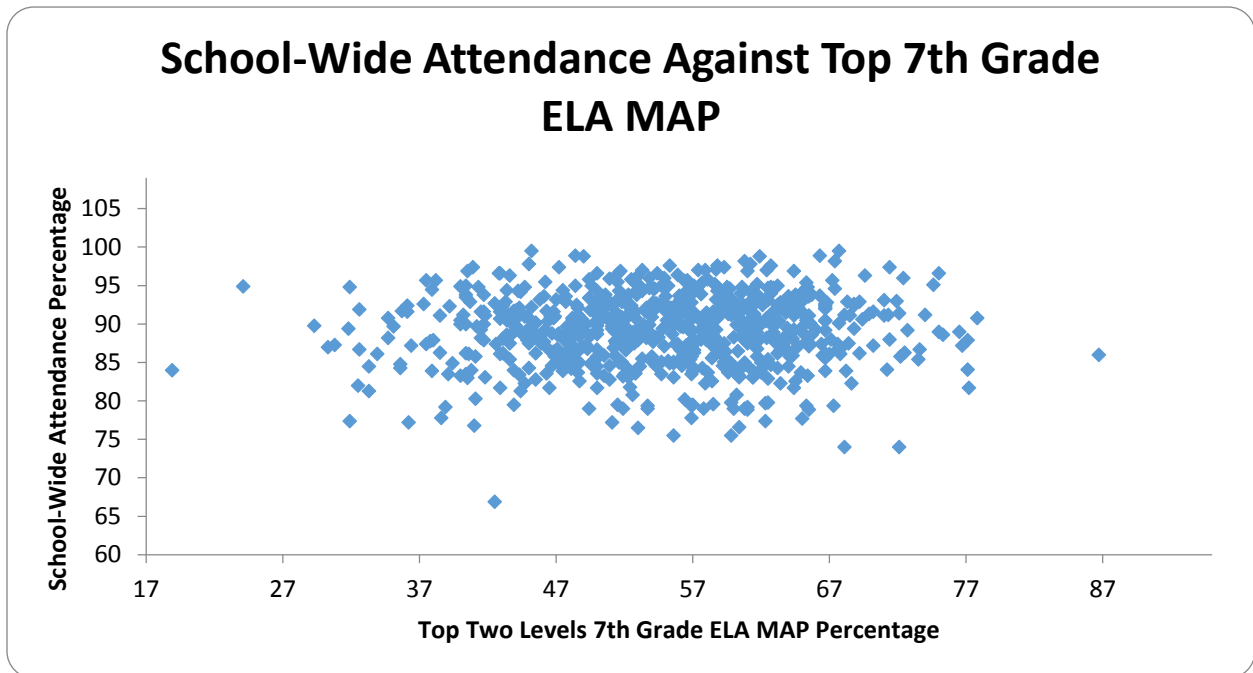
As shown in Figure 7, a scatterplot of the school-wide attendance percentages graphed against the percentages of students scoring the bottom two levels of the MAP spectrum on the 7th grade ELA test was created to illustrate their relationship visually.

Figure 7: Scatterplot of School-Wide Attendance Against Bottom 7th Grade ELA MAP



As shown in Figure 8, a scatterplot of the school-wide attendance percentages graphed against the percentages of students scoring the top two levels of the MAP spectrum on the 7th grade ELA MAP test was created to illustrate their relationship visually as well.

Figure 8: Scatterplot of School-Wide Attendance Against Top 7th Grade ELA MAP



Results from Research Question #4

The fourth question that the researchers sought to answer was, “Is there a relationship between school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the scoring system on the 8th grade MAP test in English Language Arts in rural middle schools?” For the fourth question EZAnalyze® software was used to conduct two Pearson Product Moment Coefficient of correlation tests. The researchers compared the measured p-values with a set significance level of five percent, $\alpha = 0.05$.

As shown in Table 6, the observed p-values were $p = .594$ for the tests between school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the MAP spectrum on the 8th grade ELA MAP test. Since they were more than the significance level of $\alpha=0.05$, the researchers did not reject the null hypothesis which stated that there was no statistically significant relationship between school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the MAP spectrum on the 8th grade ELA MAP test. Thus, the relationship between these two data sets appeared to be statistically insignificant.

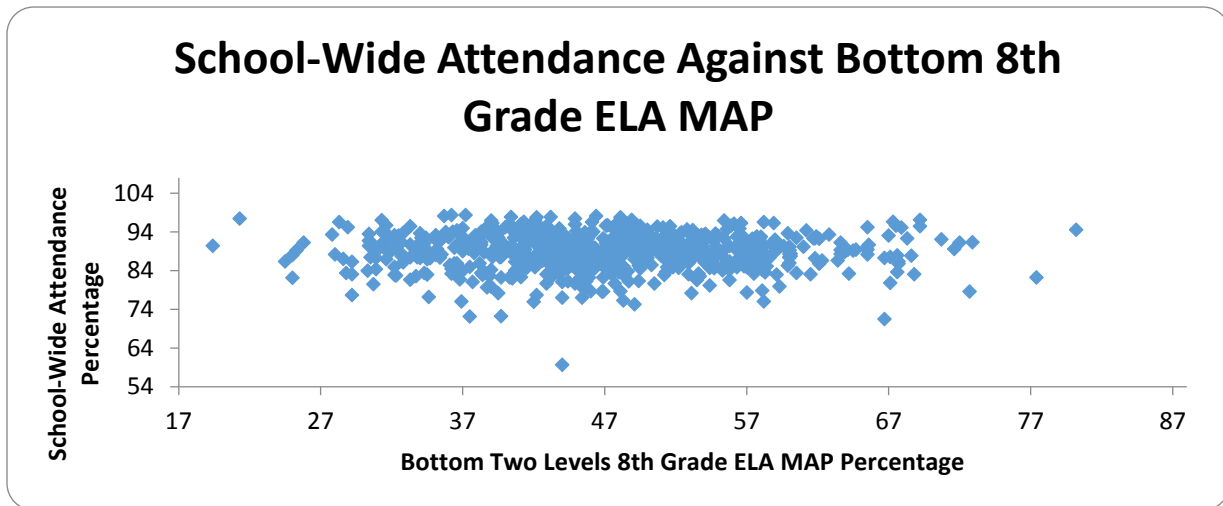
Also displayed in Table 6 were the correlation coefficients of -0.020 . These correlational measurements between school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the MAP spectrum on the 8th grade ELA MAP test were not statistically significant. The r-squared values also indicated that less than 3 percent of the variance in school-wide attendance percentages was accounted for by the variance in the percentages of students scoring in the bottom two and top two levels of the MAP spectrum on the 8th grade ELA MAP test.

Table 6: Correlation Results Between Attendance and 8th Grade ELA MAP

<i>School-Wide Attendance Compared to Bottom Two Levels 8th Grade ELA MAP</i>		<i>School-Wide Attendance Compared to Top Two Levels 8th Grade ELA MAP</i>	
Pearson		Pearson	
Correlation	-.020	Correlation	.020
N	725.000	N	725.000
P	.594	P	.594

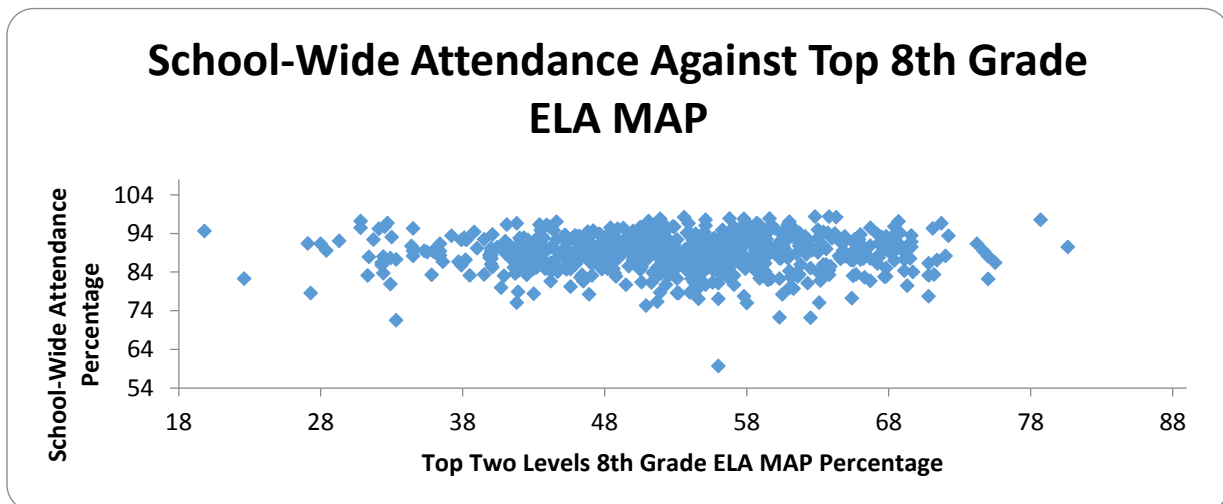
As shown in Figure 9, a scatterplot of the school-wide attendance percentages graphed against the percentages of students scoring the bottom two levels of the MAP spectrum on the 8th grade ELA test was created to illustrate their relationship visually.

Figure 9: Scatterplot of School-Wide Attendance Against Bottom 8th Grade ELA MAP



As shown in Figure 10, a scatterplot of the school-wide attendance percentages graphed against the percentages of students scoring the top two levels of the MAP spectrum on the 8th grade ELA MAP test was created to illustrate their relationship visually as well.

Figure 10: Scatterplot of School-Wide Attendance Against Top 8th Grade ELA MAP



Additional Analysis for Questions 3 and 4

Upon concluding their analysis of the second two research questions, the researchers sought to additionally analyze the pooled 7th and 8th grade ELA MAP data as well. For this additional analysis, EZAnalyze® software was used to conduct two Pearson Product Moment Coefficient of correlation tests. The researchers compared the measured p-values with a set significance level of five percent, $\alpha = 0.05$.

Even though not listed as one of the original research questions and null hypotheses, as shown in Table 7, the observed p-values were $p = .247$ for the tests between school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the MAP spectrum on the 7th grade and 8th grade ELA MAP tests. Since they were more than the significance level of $\alpha=0.05$, the researchers did not reject the null hypothesis which stated that there was no statistically significant relationship between school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the MAP spectrum on the 7th grade and 8th grade ELA MAP tests. Thus, the relationship between these two data sets appeared to be statistically insignificant.

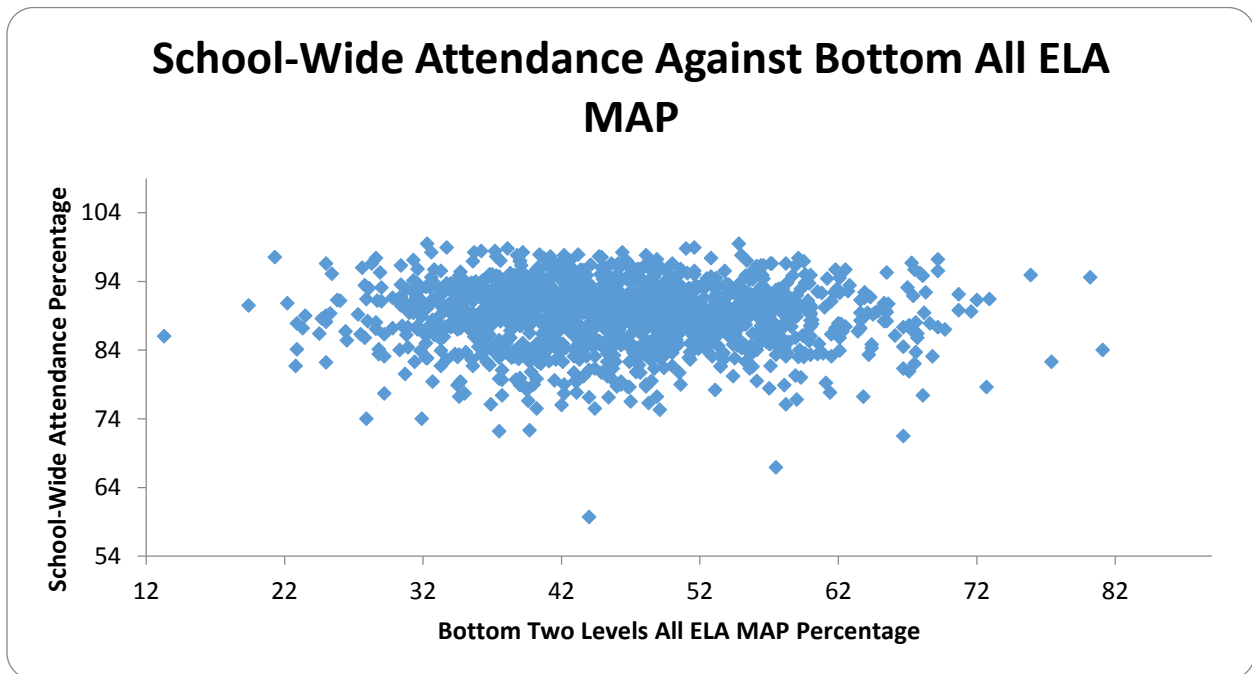
Also displayed in Table 7 were the correlation coefficients of -0.030 . These correlational measurements between school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the MAP spectrum on the 7th grade and 8th grade ELA MAP tests were not statistically significant. The r-squared values also indicated that less than 4 percent of the variance in school-wide attendance percentages was accounted for by the variance in the percentages of students scoring in the bottom two and top two levels of the MAP spectrum on the 7th grade and 8th grade ELA MAP tests.

Table 7: Correlation Results Between Attendance and All ELA MAP

<i>School-Wide Attendance Compared to Bottom Two Levels All ELA MAP</i>		<i>School-Wide Attendance Compared to Top Two Levels All ELA MAP</i>	
Pearson		Pearson	
Correlation	-.030	Correlation	.030
N	1450.000	N	1450.000
P	.247	P	.246

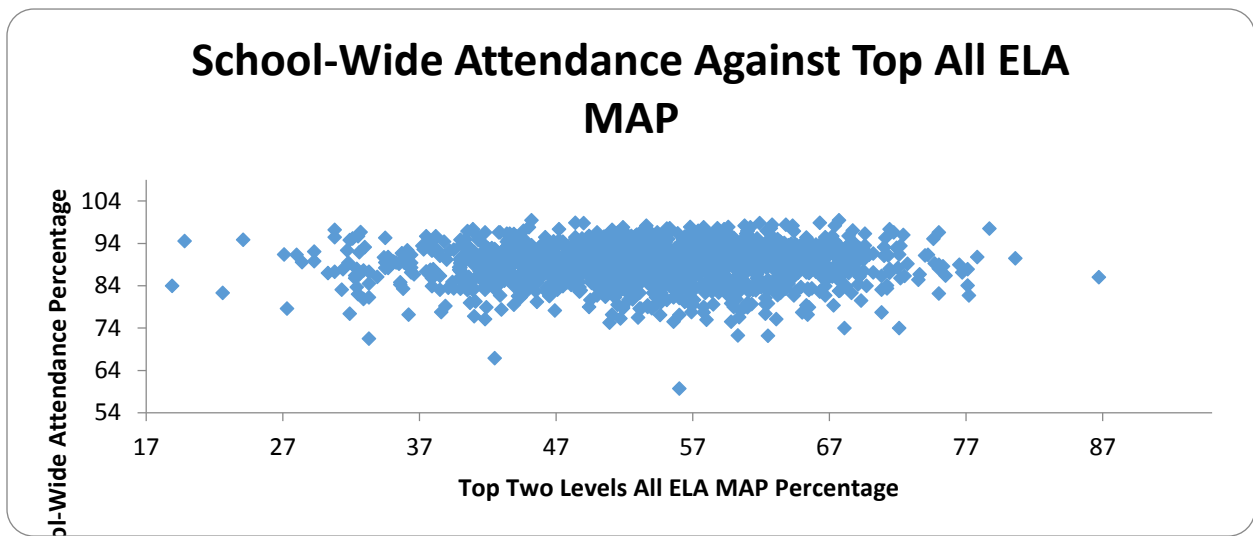
As shown in Figure 11, a scatterplot of the school-wide attendance percentages graphed against the percentages of students scoring in the bottom two levels of the MAP spectrum on the 7th grade and 8th grade ELA test was created to illustrate their relationship visually.

Figure 11: Scatterplot of School-Wide Attendance Against Bottom All ELA MAP



As shown in Figure 12, a scatterplot of the school-wide attendance percentages graphed against the percentages of students scoring in the top two levels of the MAP spectrum on the 7th grade and 8th grade ELA MAP tests was created to illustrate their relationship visually as well.

Figure 12: Scatterplot of School-Wide Attendance Against Top All ELA MAP



Final Analysis

Upon concluding their analysis of all four research questions, the researchers sought to additionally analyze the pooled 7th and 8th grade Math and ELA MAP data as well. For this additional analysis, EZAnalyze® software was used to conduct two Pearson Product Moment Coefficient of correlation tests. The researchers compared the measured p-values with a set significance level of five percent, $\alpha = 0.05$.

Even though not listed as one of the original research questions and null hypotheses, as shown in Table 8, the observed p-values were $p = .058$ for the tests between school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the MAP spectrum on the 7th grade and 8th grade Math and ELA MAP tests. Since they

were more than the significance level of $\alpha=0.05$, the researchers did not reject the null hypotheses which stated that there was no statistically significant relationship between school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the MAP spectrum on the 7th grade and 8th grade Math and ELA MAP tests. Thus, the relationship between these two data sets appeared to be statistically insignificant.

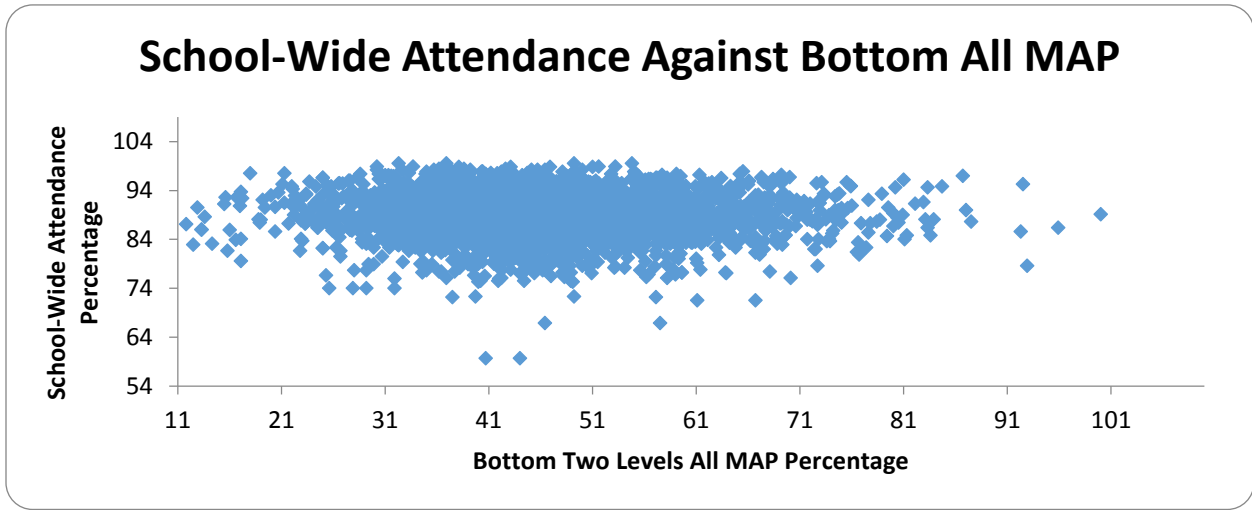
Also displayed in Table 8 were the correlation coefficients of -0.035 . These correlational measurements between school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the MAP spectrum on the 7th grade and 8th grade Math and ELA MAP tests were not statistically significant. The r-squared values also indicated that less than 4 percent of the variance in school-wide attendance percentages was accounted for by the variance in the percentage of students scoring in the bottom two and top two levels of the MAP spectrum on the 7th grade and 8th grade Math and ELA MAP tests.

Table 8: Correlation Results Between Attendance and All MAP

<i>School-Wide Attendance Compared to Bottom Two Levels All MAP</i>		<i>School-Wide Attendance Compared to Top Two Levels All MAP</i>	
Pearson		Pearson	
Correlation	-.035	Correlation	.035
N	2900.000	N	2900.000
P	.058	P	.058

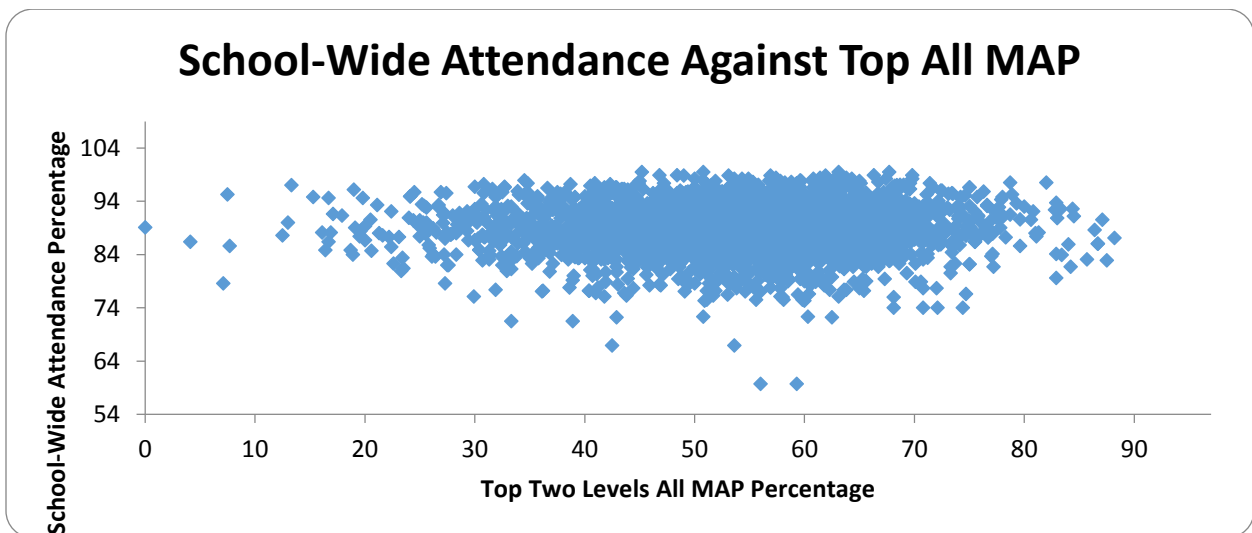
As shown in Figure 13, a scatterplot of the school-wide attendance percentages graphed against the percentages of students scoring the bottom two levels of the MAP spectrum on the 7th grade and 8th grade Math and ELA test was created to illustrate their relationship visually.

Figure 13: Scatterplot of School-Wide Attendance Against Bottom All MAP



As shown in Figure 14, a scatterplot of the school-wide attendance percentages graphed against the percentages of students scoring the top two levels of the MAP spectrum on the 7th grade and 8th grade Math and ELA MAP test was created to illustrate their relationship visually as well.

Figure 14: Scatterplot of School-Wide Attendance Against Top All MAP



Summary

Even though the researchers conducted fourteen different Pearson Product Moment Coefficient of correlation tests to measure the relationship between school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the MAP spectrum on the 7th grade and 8th grade MAP tests in both Mathematics and English Language Arts, none of the tests were found to be statistically significant. Thus, researchers did not reject any of their initial null hypotheses or any of the additional null hypotheses they tested during their additional analyses. The study contained a few delimitations intentionally implemented by the researchers and also numerous limitations not intended by the researchers, which may have impacted the data and its analysis. So, the researchers then suggest that further research be conducted on the topic of school-wide attendance percentages as compared to school-wide academic performance.

CHAPTER FIVE

CONCLUSIONS, IMPLICATIONS, AND NEW LEARNING

Overview

The purpose of this study was to determine if there was a significant relationship between school-wide attendance rates for Missouri rural middle schools between 2010 and 2014 and 7th and 8th grade MAP test scores in Mathematics and English Language Arts between 2010 and 2014. Specifically, the study targeted the statistical correlation between the school-wide attendance percentages of Missouri rural public middle schools between 2010 and 2014 and the percentages of students scoring in the top two tiers of the MAP spectrum (Proficient and Advanced) and the bottom two tiers of the MAP spectrum (Basic and Below Basic) on the 7th grade and 8th grade Mathematics and English Language Arts exams between 2010 and 2014.

Discussion of Findings

The results of this study found that there was not a statistically significant relationship between rural middle school attendance percentages and the percentages of students scoring in the bottom two and top two levels of the MAP spectrum on the 7th grade and 8th grade MAP tests in both Mathematics and English Language Arts. Initially, eight separate Pearson Product Moment Coefficient of correlation tests were used to determine if a relationship existed between school-wide attendance percentages and MAP percentages. Then, in response to the initial results, six more Pearson Product Moment Coefficient of correlation tests were also conducted for additional analysis. However, none of the tests were found to be statistically significant.

As inspiration for the statistical testing, four research questions were created and then

addressed over the course of this study. In order to answer their research questions, the researchers compared the measured p-values of each statistical test with an alpha level of $\alpha=0.05$. Furthermore, r-squared values were then used to determine what percent of the variance in school-wide attendance percentages was accounted for by the variance in the percentages of students scoring in the bottom two and top two levels of the MAP spectrum on the 7th grade and 8th grade Math and ELA MAP tests. For each of the fourteen total statistical tests, the p-value was more than the significance level of $\alpha=0.05$ and the r-squared value was measured at less than 5 percent. Thus, the relationship between the data sets appeared to be statistically insignificant and the researchers did not reject any of the null hypotheses, which stated that there was no statistically significant relationship between school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of the 7th and 8th grade Math and ELA MAP tests in Missouri rural middle schools between 2010 and 2014.

Results from addressing the first research question, focusing on 7th grade Math MAP percentages, showed a p-value of $p = .435$, which is more than the significance level of $\alpha=0.05$, and a correlation coefficient of 0.029, which is not statistically significant. Similarly, the findings from research question two, which focused on 8th grade Math MAP percentages, was also statistically insignificant due to a p-value of $p = .215$, which is more than the significance level of $\alpha=0.05$, and a correlation coefficient of 0.046.

Research questions three and four focused on the 7th grade and 8th grade English Language Arts percentages though. For the 7th grade percentages, a p-value of $p = .291$, which was more than the significance level of $\alpha=0.05$, and a correlation coefficient of -0.039, which was not considered significant, was calculated. For the 8th grade percentages, a p-value of $p=.594$, which is more than the significance level of $\alpha=0.05$, and a correlation coefficient of -

0.020, which is not statistically significant, was calculated.

Conclusions

One conclusion that can be drawn from this study is that school-wide attendance percentages for Missouri rural public middle schools between 2010 and 2014 did not have a significant relationship with the percentages of students who scored in the bottom two and top two tiers of the MAP test in Math and ELA between 2010 and 2014. While the data sets that were tested were not considered to be statistically correlated, the researchers understand that there were limitations to this study which may have had an impact. Also, the researchers recognize that prior research and literature still suggest that there is a significant relationship between attendance and academic achievement.

Roby (2004), found a moderate to strong statistical relationship at various grade levels in large Ohio school districts between student attendance and student achievement based on school-wide attendance rates and students' scores on the Ohio Proficiency Test. In addition, Gottfried's (2010) research study, which used longitudinal data sets, showed a significant relationship between individual students' attendance rates in relation to their individual achievement across grade levels. Because of the limitations to this particular study and the various outcomes of previous research involving attendance and achievement, further research on the relationship between student attendance and student achievement is recommended.

Further Research

The researchers suggest the following recommendations for further research on the relationship between attendance and achievement:

Recommendation One. The data sets analyzed in this study were limited to rural public middle schools in Missouri. A larger data set including rural schools across the Midwest, with similar demographics, might provide better statistical reliability.

Recommendation Two. The data sets analyzed in this study were limited to rural public middle schools in Missouri. Expanding the data sets to include rural, suburban, and urban districts in Missouri might provide additional information as to the relationship between attendance and achievement.

Recommendation Three. Narrowing the data sets based upon a chosen characteristic, such as free and reduced lunch percentages, poverty percentages, or minority percentages might provide more specific information on the relationship between attendance and achievement.

Recommendation Four. This study analyzed school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of MAP tests. Further research might include a longitudinal study of individual student attendance rates in relationship to their achievement scores over several grade levels instead.

Recommendation Five. This study analyzed school-wide attendance percentages and the percentages of students scoring in the bottom two and top two levels of MAP tests. Further research might focus on truancy, such as tracking students whose attendance rates fall within an unacceptable percentage, to see if there is a stronger relationship between chronic absenteeism and achievement.

Recommendations for Policy and Practice

Regardless of the statistical findings of this study, there continue to be multiple educational implications associated with student attendance and student achievement based upon

prior research. According to Epstein and Sheldon (2002), “Students who are not in class have fewer opportunities to learn the material that enables them to succeed later in school” (p. 308). In addition, The National Forum on Educational Statistics (2009) states, “Any absence, whether excused or not, denies students the opportunity to learn in accordance with the school’s instructional program” (p. 1). Also, Balfanz & Byrnes (2012) write, “The public education system is based on the assumption that students regularly attend school. Compulsory education laws back up this assumption. The standards and accountability movement of the past 25 years represent an on-going attempt to make every day of school matter” (p. 6).

As a part of school accountability, every school district should have school attendance policies in place that outline expectations for attendance and also clarify how those policies will be implemented. In addition, every school district should be required to have a plan in place to assist students who are identified as being impacted by attendance. According to Epstein & Sheldon (2002), “School characteristics and practices can influence rates of absenteeism and truancy among students” (p. 309). As schools put systems in place to measure and monitor student absences, educators can begin to respond to the specific needs of students through interventions.

In addition to schools implementing policies on attendance, Missouri state attendance standards expect 90 percent or more of students to be in school 90 percent or more of the time (LEA Guide, 2015-2016). MSIP 5 also holds schools accountable for attendance rates as part of the accountability system for reviewing, accrediting and funding public school districts in Missouri (MSIP, 2016). Educators should encourage the adoption of policies at the state level which continue to address attendance and chronic absenteeism in public schools. Without these policies, schools may not regularly monitor absenteeism or explore the reasons why students are

absent. As a result, the possible supports and interventions that students may need to be successful in school and in life may not be implemented.

Since some students face unique circumstances that impact their ability to attend school, the educational practices which support students who are identified as having dangerously low attendance rates might include extending traditional school hours to accommodate these students who miss out on learning opportunities. These students, especially those from at-risk families, may have to stay home to take care of family members who are suffering from an illness or they may need to work to help support their families instead of attending school. In order to support these students with truancy concerns, schools can develop alternative schedules to meet the unique dynamics of each particular student. Epstein and Sheldon (2002) recognize the importance of connecting with families as a way to support student attendance and decrease chronic absenteeism. Many school districts should find ways to support the implementation of case workers or form partnerships with community organizations as well to provide wrap around services for students and at-risk families in order to address factors that are impacting attendance.

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