

AYP BUILDING LEVEL ACCOUNTABILITY PROFILES:  
MISSOURI PUBLIC SCHOOLS 2004-2005

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A Dissertation  
presented to  
the Faculty of the Graduate School  
at the University of Missouri-Columbia

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In Partial Fulfillment  
of the Requirements for the Degree  
Doctor of Education

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by

Linda S. Stenger

Dr. Phillip E. Messner, Dissertation Advisor

December 2006

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The undersigned, appointed by the Dean of the Graduate School, have examined the dissertation entitled

AYP Building Level Accountability Profiles: Missouri Public Schools 2004-2005

Presented by Linda S. Stenger

A candidate for the degree of Doctor of Education

And hereby certify that in their opinion it is worthy of acceptance.

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Dr. Phillip E. Messner

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Dr. Kristi Alexander

---

Dr. Carole Edmonds

---

Dr. Barbara Crossland

---

Dr. Joyce Pivalal

## ACKNOWLEDGEMENTS

Without Dr. Phillip Messner I would never have make it to the end of this process. Thank you for encouraging me and making sure that I was producing a product that I was proud of. I would also like to thank my dissertation committee, Dr. Joyce Piveral, Dr. Kristina Alexander, Dr. Barbara Crossland, and Dr. Carole Edmonds, for the many hours they spent in reading this dissertation and attending both the proposal hearing and the dissertation defense. Their advice was invaluable.

I would also like to thank the members of my cohort. The time we spent together will always be remembered fondly. I especially want to thank Dee Moore who was my roommate in those summer sessions and my moral support throughout the process. And most of all I want to thank my friend, Joanne Anderson. Without her I would not have finished this degree. She pushed me to finish when I was not sure that I would ever make it to the end. She has read and reread this dissertation so many times that she probably has it memorized.

I also want to thank my family. Frequently when I talked with my mother she would ask, "Are you done yet?" or "Are you going to get this done while I am still alive?" My son, Geoffrey, and his wife, Jennifer, have encouraged me throughout this process. I now have a grandson, Christopher, who has been a wonderful distraction. Dan, my husband, passed away before I could finish, but I know that he would be very proud and will be there is some way for my graduation.

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AYP BUILDING LEVEL ACCOUNTABILITY PROFILES: MISSOURI PUBLIC  
SCHOOLS 2004-2005

Linda S. Stenger

Phillip E. Messner, Dissertation Advisor

ABSTRACT

The purpose of this study was to provide data to identify Missouri Public School Building variables that impact adequate yearly progress (AYP) status. AYP is determined using only Communication Arts and Mathematics scores. Data were collected from Missouri Department of Elementary Education for the 2004-2005 school year. SPSS was used to analyze the data collected. The study design used descriptive statistics, ANOVA, and discriminate analysis (DA) to provide school personnel with information about factors that discriminate between school buildings that made AYP and those that did not.

School building variables including school size, class size, student teacher ratio, attendance rate, dropout rate, and discipline reports were found to make significant differences in both the ANOVA and the DA. Student variables including free/reduced lunch, white, Black, Asian, Hispanic, Indian and level not determined in both Communication Arts and Mathematics were not found to discriminate between schools that made AYP and those that did not. Interestingly, all of the student variables except Hispanic were found to be significantly different using the ANOVA.

Results of this study show that school building variables do make a difference in student achievement and that school personnel need to work with all students to improve achievement in this era of accountability for public

schools. School districts have control over school building variables and need to find ways to either make schools smaller or seem smaller, make classes smaller, increase attendance, lower the dropout rate and lower the number of discipline reports.

## CHAPTER 1

### INTRODUCTION TO THE STUDY

Darling-Hammond's (2000) national study correlated teacher quality, financial attributes, school profile, and student variables to student performance at the national level using National Assessment of Educational Progress (NEAP) results. The Darling-Hammond study identified state level variables from selected states that correlated with NEAP scores. Darling-Hammond indicated that analyzing similar data at a level closer to the student would give different results. Since school buildings are held accountable for performance on state tests, and few studies have been done using similar public school variables at the school building level, this study will use discriminate analysis to focus on the differences between school buildings in the state of Missouri that do make adequate yearly progress (AYP) and those that do not. This study will provide a profile for school buildings that make AYP and those that do not.

Darling-Hammond (2000) found that teacher variables were the best predictors of student achievement. She realized that teacher variables could not be studied in isolation since other variables affect teacher variables and student achievement in schools. When she did her study, the No Child Left Behind (NCLB) act, which was passed in 2001, did not exist. However, NCLB reflects her findings by requiring that all teachers must be highly qualified (fully certified and teaching in area). Since all schools are required to have highly qualified teachers, this study will focus on student and school building variables only.

NCLB holds buildings accountable for overall student performance as well as student performance in subgroups.

To hold schools accountable, NCLB has mandated that all students will be proficient in mathematics and communication arts by 2014 and that AYP will be attained each year to reach that goal. If the goal is not reached over time, the school may receive corrective action or be taken over by the state. Since AYP determines whether a school building can be taken over by the State Board of Education, this study will conduct discriminant analysis to determine which variables can be used to discriminate between school buildings that make AYP and those that do not.

In the last decade, accountability has become “a modern buzzword” (Lerner & Tetlock, 1999, p. 255) in the education community because of the implementation of AYP required by the NCLB legislation. Even with the progression of education reform enacted since the advent of “A Nation at Risk” in 1983, students were still not performing at the apparent levels necessary for the United States to compete in a world economy. Both the National Assessment of Educational Progress (NAEP) and the Third International Mathematics and Science Study (TIMSS) rated students in the United States as mediocre in achievement. In an effort to improve scores and student achievement, accountability has emerged as the foundation of national and state reform. Schools are being held accountable for student performance on state level tests for all groups including the subgroups that traditionally achieve lower test scores; therefore, understanding the differences between school buildings that make

AYP and those that do not, especially with minority and low income subgroups, is essential. For the first time, specific levels of achievement have been established and a system of sanctions has been designed (ASCD, 2005).

As school buildings are being held accountable for AYP determination, there is an increasing level of frustration. Instead of leaving no child behind, some of the children that are in the most need are not getting the help that they should (Booher-Jennings, 2006). In some cases students that are not close to proficiency on the test are neglected so teachers can concentrate on the students who are close to proficiency. Subgroups that are not large enough to count for AYP are also neglected. The real focus is on the test scores rather than the needs of the students.

As the AYP benchmarks rise and more school buildings fail to make AYP, states and school districts are getting creative in ways to count more students as proficient (Popham, 2005). States are lowering expectations through curricular changes, changing the level required for proficiency on the test, raising the minimum for subgroups, using confidence intervals, and encouraging students who will not score proficient to enroll in a General Education Program (GED).

Coladarci (2005) states that while some of NCLB is hard to disagree with such as the accountability for all schools and adequate opportunity for all students to learn, the goal of 100 % proficiency by 2014 is unattainable. This goal is set without any empirical evidence. Under the best of circumstances school buildings will fall short of the 2014 goal. As the benchmarks rise, school buildings continue to struggle to meet the accountability demands of NCLB.

## Conceptual Underpinings

In this study the conceptual underpinning is accountability theory based on Lerner and Tetlock (1999), Macpherson (1996), and Elmore, Abelman, and Fuhrman (1996). “Accountability refers to the implicit or explicit expectation that one may be called on to justify one’s beliefs, feelings, and actions to others” (Lerner & Tetlock, 1999, p. 255). Although Tetlock is the leading researcher in accountability theory, much of his research was done in the laboratory or in the field within the realm of social psychology not education (Robinson & Timperley, 2000). The state of Missouri is explicitly holding schools accountable for AYP based on Missouri Assessment Program (MAP) scores. Since schools are now being required to justify the scores of students and face penalties when those scores do not meet required levels, this study will focus on the differences between successful schools and unsuccessful schools.

Lerner and Tetlock (1999) identified four basic components of accountability theory. One of the four components is evaluation which states that “participants expect that their performance will be assessed by another according to some normative ground rules and with some implied consequences” (p. 255) (Table 3). The focus of this study is on evaluation which holds Missouri schools accountable using the MAP with consequences for not performing according to the state standards. Each state must establish specified benchmarks for AYP and a system of sanctions (Missouri DESE, 2005).

Macpherson (1996) identifies three types of accountability theory: technical, client, and professional (Table 3). The technical theory claims that

schools improve through the use of teaching techniques that are based on scientific research. There must be a clear purpose, performance indicators and data collection. The client theory indicates that schools improve when schools are held accountable by students, parents, and community. School level scores are available and published in local newspapers allowing the community to have open discussions creating a political mechanism where clients govern school policy. The professional theory holds that schools will improve when local educators have opportunities to increase skills and control the educational environment. Teachers and school leaders are able to judge the accountability process and the validity of non-professionals is brought to question. The technical and client approaches are “easily seen to be driven by bureaucratic, economically rationalist and New Right thinking” (p. 7) and according to Macpherson are not to be taken seriously by professionals.

Nonetheless, the technical and client approaches are taking precedence over professionalism; and accountability has changed. It has moved from process accountability to outcomes accountability (Fuhrman, 1999) which differs from earlier approaches in that the new accountability systems have taken their perspective from business (Fuhrman, 2003), and has moved from district to school building level as the accountability unit (Fuhrman, 1999).

In the past school buildings were held accountable for process (inputs), but today the emphasis has switched to test scores (output) (Fuhrman, 2003). Morgan (1997) also reflects the accountability theory being used in schools in his open system. He includes inputs and outputs but adds throughputs. Morgan



divided the inputs into inputs and throughputs, thus giving more definition to what is controllable by the school building. The inputs are resources coming into the school building. In this study those resources are the students with their different knowledge, abilities, and ethnicities. The throughputs are “internal transformations” (p. 40) or the variables that the school building can control. The outputs are the products produced by the school. In the study the output or product is the AYP determination. See Table 1 for inputs, throughputs and outputs used in this study. According to Morgan the information from the output should flow back to the inputs and throughputs to improve the school building’s AYP determination. Without this flow of information, improvement does not take place.

Table 1

Morgan's Open System Theory: Variables from this Study

Inputs	Throughputs	Outputs
Free/reduced lunch	Pupil to teacher ratio	AYP status
LEP	Class size	
Students with disabilities	Attendance rate	
Asian	Discipline reports	
Black	Dropout rate	
Hispanic	School size	
Indian	Level not determined	
White		

As a result of this apparent lack of improvement in education, the NCLB Act was signed into law in 2001 and unlike previous laws at the federal and state levels, this law specifically requires accountability. According to Timar (2003), a

new accountability model based on the model designed by Elmore, Abelman and Fuhrman was initiated by the federal government (Table 2). This model includes setting performance standards, testing against those standards and then creating consequences for not meeting those standards (Elmore, Abelman, & Fuhrman, 1996). This accountability model became the basis for NCLB with testing for evaluation and sanctions for failing (Timar, 2003) using AYP to decide which schools should be sanctioned (Paige, 2002; U. S. Department of Education, 2003). The three components of the accountability model are present in NCLB. First, to measure student performance, grades three through eight and one grade in high school are to be tested in mathematics and communication arts using results from challenging tests based on state standards. Data must also be disaggregated by subgroups, and all groups must attain proficiency in mathematics and communication arts by 2014. NCLB directs all states to “implement statewide accountability systems covering all public schools and students” (U. S. Department of Education, 2002, p. 1). Secondly, to create a complex system of comparison by school buildings and locality, school buildings must meet AYP toward the goal of 100% proficiency in mathematics and communication arts in 2014. In Missouri proficient is identified as scoring a 4 or 5 on the MAP test. Each state determines its own yearly goals starting at its own baseline. Lastly, to create systems of rewards and punishments to improve performance, schools that do not meet AYP over time may receive “improvement, corrective action, and restructuring” (U. S. Department of Education, 2002, p. 1). With these sanctions being considered, determining

differences between school buildings that make AYP and those that do not becomes imperative.

Table 2

*Accountability Theories*

Name of Theorist(s)	Components of theory	Theory applicable to this study
Lerner and Tetlock	presence of another personal identification evaluation reason-giving	yes
Macpherson	technical client professional	yes yes
Elmore, Abelmann, and Fuhrman	setting standards testing against standards creating consequences	yes yes yes

Rationale for the Study

Darling-Hammond (2000) said, “Despite conventional wisdom that school inputs make little difference in student learning, a growing body of research suggests that schools can make a difference” (p. 1). Since the Darling-Hammond study was done before NCLB, the variables she studied: (a) teacher variables, (b) financial attribute variables, (c) student variables, and (d) school building variables, have become even more important. When Darling-Hammond did her study, there were no consequences for low student achievement and AYP did not exist. Now, schools are held accountable if they do not made AYP both as a whole and among the subgroups and may be restructured by the state. Her study

used multiple regression to identify variables that predicted student achievement at the national level. Now in turn, this study will identify the individual school building profile variables that describe the difference between school buildings that make AYP and those that do not. AYP determination is the mechanism used to decide which school buildings receive rewards and which receive sanctions.

The Missouri School Improvement Program (MSIP) promotes quality public education. The Performance Standard of MSIP requires all students to be assessed in academic achievement. Each district is required to have its own Comprehensive School Improvement Plan (CSIP) which guides the district in making decisions about achieving higher student performance which is measured using AYP (Missouri DESE, 2004). This study will provide a resource for school districts to determine what school building profile variables can make a difference in AYP outcomes.

#### Statement of the problem

According to the NCLB, by 2014 all students must score at the proficient level. There are also benchmarks called adequate yearly progress (AYP) for each year to reach this goal. Schools that are unable to make AYP as designated by the state of Missouri are in danger of being restructured by the state. Since schools are held accountable for student performance including performance of students in low-income, minority and limited English proficiency subgroups, there is a need to better understand which building variables best discriminate between schools that make AYP and those that do not.

## Purpose of the Study

School building personnel are held accountable for student performance. The purpose of this study purports to provide data to identify Missouri public school building profile variables that impact AYP status. The variables are divided into two clusters, school building variables and student variables. This study will use discriminant analysis to describe membership in the group of school buildings that make AYP and those that do not. See Table 3 for the list of public school building profile variables used in this study. These variables are similar to the student and school building variables used by Darling-Hammond (2002). Student variables with asterisks were not included in the Darling-Hammond study but are included here because they are used in determining AYP status. Her study used minorities as a single group instead of dividing into subgroups.

Table 3

Public School Building Profile Variables by Clusters

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AYP Determination

School Building Variables

- Pupil to teacher ratio
- Class size
- Attendance rate
- Discipline reports
- Dropout rate
- School size

Student variables

- Free/reduced lunch
- LEP
- Students with disabilities \*
- Asian \*
- Black \*
- Hispanic \*
- Indian \*
- White \*
- Level not determined-Math\*
- Level not determined-CA\*

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Note: The data are all available on Missouri DESE Annual Reporting 2004-2005

Note: \* Variable not used in Darling-Hammond (2000) study

Research Questions

1. What are the measures of central tendencies and dispersion of the Missouri public school building profile variables? (See Table 1 for the list of public school building profile variables.)
2. Are there any mean differences for Missouri public school building profile variables between school buildings that make AYP and school buildings that do not make AYP

3. Can variables from the school building cluster discriminate between school buildings that will make AYP and those that will not?
4. Can variables from the student cluster discriminate between school buildings that will make AYP and those that will not?

#### Null Hypotheses

1.  $H_0$ : There are no significant mean differences for Missouri public school variables between schools that make AYP and schools that do not make AYP.
2.  $H_0$ : No variables from the school profile cluster discriminate between schools that make AYP and those that do not.
3.  $H_0$ : No variables from the student cluster discriminate between schools that make AYP and those that do not.

#### Delimitations

Results of this study are delimited by the following:

1. The data from this study are limited to Missouri public school buildings.
2. The data from this study are for only year 2004-2005.
3. This study is limited because it is only using the Missouri public school building variables that are similar to the ones used by Darling-Hammond.

#### Glossary of Key Terms

*Accountability.* The necessity to accept the responsibility for one's actions and have an understanding of the consequences

*Adequate yearly progress (AYP).* Each state's measure of progress toward achieving state academic standards on a yearly basis

*Attendance rate.* Percent of days of attendance

*AYP Determination.* Made AYP or did not make AYP

*Benchmarks.* Levels set by each state to measure AYP

*Blue Ribbon School.* School that is academically superior in its state or has made dramatic improvement in student achievement

*Class size.* Ratio includes only teachers excluding special classes, i.e. music, art

*Discipline rate.* Number of students removed from the traditional classroom for ten or more days divided by the total population

*Dropout rate.* Number of students that have dropped out divided by the September enrollment plus transfers in minus transfers out then divided by 2

*Highly qualified teacher.* An individual who has the appropriate certification for his/her teaching assignment

*Level not determined (LND).* Assessment that cannot be scored or is blank

*No Child Left Behind Act.* The reauthorization of the Elementary and Secondary Education Act signed into law in 2001

*Proficient.* In Missouri, scoring a four or a five on the MAP test

*Public School Building Profile.* Variables that describe the building using both building variables and student variables

*School Building Cluster.* Variables that describe the school building

*School Size.* Total enrollment in the school building

*Student Cluster.* Variables that describe the characteristics of the students using subgroups



*Student Engagement.* Name given to the discriminate function for the school building cluster

*Student teacher ratio.* Ratio includes all teachers

*Subgroups.* Defined by NCLB to be Asian, Black, Hispanic, Indian, white, students with disabilities, limited English proficient, and free/reduced lunch status (For a school to be held accountable for a subgroup, most subgroups must contain 30 students. IEP and LEP must contain 50 students.)

### Summary

Studies have been done at the state and national levels to identify the relationship between student achievement and selected state and district variables. Darling-Hammond (2000) did a national study correlating teacher quality, financial attributes, school profile, and student variables to student performance at the national level using National Assessment of Educational Progress (NEAP) results. Since few studies have been done using a variety of variables at the school building level, this study looked at the way school buildings are held accountable based on variables similar to those used by Darling-Hammond at the national level. This study focused on the differences between public school buildings in the state of Missouri in the 2004-2005 school year that made AYP and those that did not.

## CHAPTER TWO

### REVIEW OF LITERATURE

Public schools have traditionally been held accountable for educating the majority of the nation's school children. Through the years schools have been evaluated in a variety of ways with a similar variety of results. Currently more emphasis on accountability has resulted in the need for school districts to carefully examine how programs and policies impact student achievement. This study examined the way Missouri schools are coping with accountability and the characteristics of schools that are most successful in helping students achieve. Because the No Child Left Behind Act (NCLB) (2002) places emphasis on subgroup scores, many Missouri schools have been identified as deficient or will be in subsequent years. Therefore, this study will focus on the specific characteristics of schools with both high scores and a population that includes a majority of low-income, minority and/or limited English proficient students. The following review of selected research reflecting the background of public school accountability will focus on the measures taken to evaluate schools and students and the relationship between school variables and student achievement. The information reviewed in this chapter was selected after an extensive analysis of information available.

#### *Accountability*

The National Commission on Teaching and America's Future asserts that the new accountability in education focuses responsibility on students and teachers as well as everyone else in the educational community. High student

achievement requires commitment from every source (Hunt & Carroll, 2003; Fuhrman, 1999).

Tetlock is the leading researcher in accountability theory (Lerner & Tetlock, 1999). His research was in the field of social psychology not education.

He identified four basic components of the theory:

- (1) mere presence of another (participants expect that another will observe their performance),
- (2) identifiability (participants expect that what they say or do in a study will be linked to them personally),
- (3) evaluation (participants expect that their performance will be assessed by another according to some normative ground rules and with some implied consequences), and
- (4) reason-giving (participants expect that they must give reasons for what they say or do) (p. 255).

Evaluation is the basis for the accountability that school districts across the nation are facing due to NCLB and the requirements of AYP. Students will be expected to demonstrate on a state mandated reading and mathematics tests that they are performing at grade level. In turn school districts must demonstrate that all students from all subgroups are performing at a sufficient level for the schools to attain AYP. By 2014 all schools must reach 100%. Any school that does not reach AYP will face punitive measures. In that way the participants know that their performance will be evaluated according to specific rules and expectations and failure to meet the goals will result in identified consequences.

## National Accountability

The history of the current trend toward accountability began in 1964 when the Gardner Commission recommended combining educational funding with President Johnson's initiative, War on Poverty. They wanted to bring poor students out of poverty through education (Mantel, 2005). Out of this connection came the Elementary and Secondary Education Act of 1965 (ESEA). One of the most important components of the Act was Title I, which provided funds to school districts with high percentages of low income students. Over a billion dollars was allocated to 94% of the nation's schools to improve educational resources for children in poverty. Little accountability beyond evaluations of student achievement was required, and by 1980 many misappropriations of funds were identified, and funding was reduced during President Regan's terms in office. The program became Chapter I; and although its purpose of providing additional funding for low-income students remained constant, the requirements changed so fewer students benefited (Mantel, 2005).

## High Stakes Testing

A major impetus for the use of standardized tests resulted from the launching of Sputnik by the Russians in 1957 (Amrein & Berliner, 2002). Suddenly the United States was embroiled in a race for supremacy, not only in the race for space, but also in the education field. The battle began in the nation's classrooms. In 1965, the Federal Elementary and Secondary Act required evaluations in all Title I funded programs (Macpherson, 1996). During the sixties and seventies, many state legislatures rushed to pass legislation that

required districts to use standardized tests. During the early days of standardized testing, the results were most often used to determine what program of studies a student should pursue. Later, the emphasis switched to the use of minimum competency tests required for high school graduation in many states (Assessing Student Performance, 2000; Louis, Febey & Schroeder, 2005). Unfortunately instead of raising the bar for public education and encouraging high standards and excellence, the minimum competency tests became the standard resulting in even lower expectations for student achievement. Even early improvements were unreliable as more low income and minority students were unable to pass the tests and subsequently dropped out of school (Amrein & Berliner, 2002; Voke, 2002; Louis, Febey & Schroeder, 2005). Many of the early minimum competency tests focused too specifically on the results of multiple choice items without concern for student performance in the classroom. Legislators typically looked to test results and the number of students who passed the minimum competency tests to justify spending assuming that high scores were the result of strong teaching and conversely that low scores resulted from poor teaching. The complexities of the educational process were lost in the simplicity of easily scored testing (Macpherson, 1996).

In the early 1980s, Secretary Bell directed the National Commission on Excellence in Education (1983) to examine education in the United States. The Commission published its report, "A Nation at Risk," which addressed the inadequacies of the educational system at that time. The report made recommendations concerning content, standards and expectations, time,

teaching and leadership and fiscal support. However, accountability was not a part of the report. Even though there was a positive response by the educational community, according to Edwards and Allred (1993), there was little follow up to determine if any of the recommendations had been implemented. Their nationwide survey found that most of the suggestions were implemented only to a limited extent. For example, 41 states increased the number of credits required for high school graduation; and requirements for teacher certification increased in 29 states (Thomas & Brady, 2005; Amrein & Berliner, 2002).

After more than two decades of implementing “A Nation at Risk,” students were still not performing at the apparent levels necessary for the United States to compete in a world economy. Both the National Assessment of Educational Progress (NAEP) and the Third International Mathematics and Science Study (TIMSS) identified the scores on their assessments of students in the United States to be mediocre. However, Bracey (1999) suggests that some of the data collection is flawed, and U. S. student performances are at a par with other countries.

By 1988 states were held accountable for Title I funds and were required to determine student progress on test scores. This led to America 2000 which focused on academic standards and changed requirements for expenditure of federal funds. America 2000 did not pass the Senate, but served as the forerunner for Goals 2000 which was passed in 1994. Several educational initiatives emerged from Goals 2000. Challenging academic standards were applied to all students, and test results became the method of choice for

identifying reform success. In addition, ESEA became the Improving America's Schools Act (IASA) and required all states to develop performance standards and introduced the concept of adequate yearly progress (AYP). The allocation of Title I funds was based on the achievement of students eligible for the funding (Borman, 2005).

The latest national "fix" for education is the No Child Left Behind (NCLB) Act signed into law in 2002. NCLB puts the Federal government at the forefront of educational policy (ASCD, 2005). NCLB is an attempt by the government to "implement statewide accountability systems covering all public schools and students" (U. S. Department of Education, 2002, p. 2). Grades three through eight and one grade in high school are to be tested in reading and mathematics using challenging state standards. Data must also be disaggregated by subgroups, and all groups must attain proficiency by 2014. Schools and districts must also meet adequately yearly progress (AYP) toward the goal of 100% proficiency. If they do not meet AYP over time, they may receive "improvement, corrective action, and restructuring" (p. 1). With these punitive actions being taken, it becomes imperative that schools determine the characteristics of a high performing school (Coeyman, 2002; Allen, 2004; Mathews, 2003).

The trend in accountability is toward assessing scores on high stakes standardized tests. The requirements of NCLB focus on test results and subgroup scores. Both rewards and sanctions are tied to improvements in test scores, and school districts must strive to reach mandated goals of NCLB. Previously, most schools met established goals by looking at scores that

reflected an average of the school population. However, a requirement of NCLB is that all subgroups must also be in the proficient category. Schools that had been honored as exemplary by receiving the Blue Ribbon Award for either outstanding achievement or dramatic improvement are now deemed to be failures because of AYP, and eventually most schools will fall into the failure category (AERA Position Statement, 2000; Voke, 2002; Amrein & Berliner, 2002).

### Missouri Accountability

In 1983, the Missouri legislature passed the Excellence in Education Act that established core competencies and key skills in reading, mathematics, science and social studies. It required all school districts to test students based on those competencies and to identify deficiencies. Districts were then required to develop strategies to address and to correct the problem areas. Teachers across the state helped to develop a testing instrument that would reflect the requirements of the core competencies. The result was the Missouri Mastery and Achievement Test (MMAT) for grades 3, 6, 8 and 10. The test was given annually in the spring to more than 50,000 students across the state of Missouri. The test consisted of four subtests in the core areas of reading, mathematics, science and social studies with up to 100 multiple choice questions in each subtest. Administration of each subtest required up to two hours. This test led the way to the development of the Missouri Assessment Program that was designed to test all Missouri students at various grade levels (MMAT Summary Report, 1996).



Judge Byron Kinder issued a ruling in 1993 stating that Missouri's "system of funding education was so unfair and unequal that it was unconstitutional" (A Primer, 1993, p. 4). As a result of that ruling The Outstanding Schools Act (OSA) was implemented addressing the quality of Missouri public schools and the inequality of state funding for education. The new law set out to accomplish the following goals: strengthen basic education, adopt performance standards, develop frameworks, implement statewide testing, ensure teamwork and accountability, and increase equity. As a result of OSA the state gathered together teachers to write the state assessment. It was called the Missouri Assessment Program (MAP). The test was to be used to measure progress toward performance standards at individual schools. Schools were not to be measured against the state average. The assessment program was never designed as an instrument to compare one school against another. However, now MAP is used to determine AYP status and is used to make comparisons between schools.

With this new accountability theory in place, schools rather than districts are now the accountability unit (Fuhrman, 1999; Fuhrman & Elmore, 2004; Timar, 2003). Instead of inputs, pupil/teacher ratio, curriculum, school board minutes, etc. (Fuhrman, 1999), the focus of accountability is now on outputs, specifically student performance. Consequences have also been established with the new accountability system. When student performance is at acceptable levels, schools make AYP and are rewarded. When student performance is not at acceptable levels, schools do not make AYP and are sanctioned.

Since enactment of Senate Bill 380, all Missouri school districts must be evaluated based on a Comprehensive School Improvement Plan (CSIP) within a five-year evaluation cycle. The Missouri School Improvement Program (MSIP) is responsible for accrediting all of the school districts in Missouri. The Missouri DESE school improvement committee administers all evaluations. Each school district must collect data since part of the performance standard depends on MAP scores from all students including subgroups. The department provides training and assistance throughout the evaluation process. (Missouri DESE, 2003).

#### School Characteristics Relating to Accountability

Since student performance is at the forefront of accountability, and schools are being held accountable for the performance of their students, schools need to know the characteristics of successful schools. Darling-Hammond (2000) states, "Despite conventional wisdom that school inputs make little difference in student learning, a growing body of research suggests that schools can make a difference and a substantial portion of that difference is attributable to teachers" (p. 2). Other school characteristics were included in the Darling-Hammond study and are grouped as socio-economic status (SES), financial, and school data for this research.

#### Student Characteristics

Student characteristics are those characteristics that students bring with them to the school building. The subgroups identified by NCLB include

free/reduced lunch students, students with disabilities, minority students, limited English proficiency students.

### *Free and Reduced Lunch Students*

Students enrolled in programs that identify low income such as Free and Reduced Lunch Program, typically score lower on standardized tests. Biddle and Berliner (2003) cite a 1999 study of scores on the 8<sup>th</sup> grade Second International Study of Mathematics Achievement Test that indicated a strong correlation between student performance and both student poverty and per pupil expenditure. The study indicated that the socioeconomic level of the student had an even stronger impact on student performance than per pupil expenditure. However, both factors resulted in lower test scores. Marlin and Orland's study of how student scores are influenced by the socio-economic status of the student confirmed that students who are enrolled in high poverty schools or who are personally in a poverty situation for an extended period will have lower achievement (Nyhan and Alkadry, 1999). The Pearson Correlation results for 4<sup>th</sup> grade mathematics and reading test scores for 1994-95 show a negative correlation between the percentage of students on Free and Reduced Lunch and scores on the math and reading tests (Okpala, 2002),

In schools with high percentages of students enrolled in Free and Reduced Lunch programs, the teacher turnover rate tends to be equally high. The highest turnover occurs in schools with more than 75% of students with Free and Reduced Lunch (Teaching Quality, 2002). NCLB requires a highly qualified teacher in every classroom since research shows that student achievement

improves with quality teaching (Peske & Haycock, 2006). The very students who need continuity most are thrown into situations where they sometimes do not know who will be teaching their classes, and too often the teacher will not be highly qualified. High poverty schools have little continuity of teaching staff, learning strategies or awareness of student needs, All of these problems contribute to low scores on math and reading tests (Teaching Quality, 2002).

High-poverty schools will be labeled failing because of their inability to meet AYP when in reality they may be making major improvements in student achievement. Schools with diverse populations that include high percentages of students from low-income families will have the greatest struggle to attain AYP. The system is not designed to reward gains in learning. It is designed only to reward reaching AYP and attaining the same standards designed for more affluent schools (Mathis, 2003).

Berliner (2005) contends that the answer to improved performance for high poverty students lies with the community at large rather than with the schools and educators alone. His approach emphasizes the need to break the poverty chain by improving the lives of children in poverty in addition to improving their educational opportunities. Providing a living wage, affordable housing, and medical care for children of poverty will improve achievement when it is paired with higher quality schools with smaller student populations.

Research consistently proves that the socioeconomic level of the school is the most significant factor in determining student success (Kahlenberg, 2006). For example, students who attend middle-class schools but are from low-income

families typically scored higher on math and reading tests than middle class students who attend high poverty schools. The social climate in most high poverty schools fosters low self-esteem, low expectations and increased discipline problems. Combined with inexperienced or poorly trained teachers and low parent involvement, these schools present a formula for low achievement (Kahlenberg, 2006) Schools that are attempting to overcome these disadvantages are channeling more experienced teachers into these schools, are developing strong expectations for students, and introducing a challenging course of study (Elmore, 2006).

### *Students with Disabilities*

In the past, schools were not required to test students with disabilities; or if they did test them, schools did not report the scores. However, in 1997 the Amendments of the Individuals with Disabilities Education Act (IDEA) required that test scores of students with disabilities must be included in the calculations of school district assessments (McLaughlin, Embler, Hernandez & Caron, 2005). In 2002 NCLB added a new dimension to assessment by requiring all subgroup scores in reading and mathematics not only to be reported, but to be in the proficient category and to be part of the calculation of AYP for a school. By including those scores with the scores of the general population, the school average score is often much lower than previously calculated (Coladarci, 2005). The initial fear in many districts was that the requirement would have a disastrous effect on building scores. However, many members of the special services departments in schools across the nation felt that it would raise the

expectations for students with disabilities and challenge them to accomplish more. Some districts have been pleased with the increasing number of students in their programs who have passed the state mandated tests and have surpassed scores of students in the general population (Nagle, Yunker & Malmgren, 2006; Reedy, 2004).

Previously an individual education plan (IEP) for a student would identify whether the student would take a state assessment. Now the IEP indicates how the student will take the test. Students in special programs are eligible for alternative assessments or may take the state test with or without approved accommodations. Some students take a combination of these three adjustments (Nagle, Yunker, & Malmgren, 2006). A change in Title I requirements in 2003 also allows schools to use alternative assessments to test students with disabilities (Browder, Karvonen, Davis, Fallen, & Courtade-Lille, 2005).

The special education field is one of the areas of education where the teacher shortage is highest. Many schools must resort to emergency certification in order to supply the classes with teachers. Having a highly qualified teacher in classes for students with severe disabilities is even more vital today since NCLB requires a highly trained teacher in every classroom. However, this is causing special problems in the special education arena because the focus of the degree is the pedagogy required to teach students with disabilities rather than a specific subject focus (Reedy, 2004). However, many schools are now requiring teachers to teach only the subject of their major rather than the type of student they are trained to teach. Ironically, the students are no longer taught by a “highly

qualified” teacher in the true sense of the term but according to the letter of the law (Samuels, 2005). Training teachers in strategies that will help students with disabilities succeed on state mandated tests is more important than ever. Reedy (2004) suggests that all teachers should be trained to teach all students, including students with disabilities, because schools that are more inclusive have better results. A North Carolina study that focused on training teachers in the use of specific teaching strategies designed to help students master requirements of the state test proved the importance of teacher training. The study identified a significant correlation between the scores on alternative assessments and the improvement of student skills identified in their individual plans. Teachers used a portfolio approach to identify strategies that were most successful with individual students. The key to the success of the program was teacher training in strategies that helped students with disabilities learn (Greer, 1996).

### Minority Students

One area of emphasis in NCLB is the achievement levels of minority students. Traditionally, African-American and Hispanic students do not score well on standardized tests. Some of the reasons include the lack of highly qualified and experienced teachers in many classrooms of minority students, cultural expectations and feelings of negativity (Closing the Gap, 2004). The majority of schools with a high percentage of minority students also have a high percentage of low income students. As cited in Closing the Gap, Wilson and Martin insist that low test scores are not based on race, but instead are directly correlated with income levels, differences in language experience and teacher preparation.

Many minority students do not have the vocabulary skills and cultural background necessary to excel on standardized tests. The language deficiency is apparent even when minority students first enter school, and the deficiency continues throughout the students' educational experiences (Darling-Hammond, 2000; Closing the Gap, 2004; Hodgkinson, 2002). In addition, fewer fully certified and experienced teachers work in high poverty high minority schools (Wilson & Martin, 2000). For example, in 2000-01 over 23% of teachers in high poverty high minority schools in California were not fully certified. Only 6% of teachers in high achieving schools lacked full certification. These figures are replicated in school districts across the nation. The gap in achievement for minority students is directly correlated with teacher preparation and experience. Teachers in high poverty high minority schools transfer to more affluent districts or schools as soon as possible. The reasons are generally related to working conditions and salary rather than an unwillingness to work with minority students (Olson, 2003; Ansell & McCabe, 2003). Part of the answer to low achievement for minority students rests with the need for highly qualified teachers in every class. In addition, teachers must have professional development to know what learning strategies are most successful with students from diverse backgrounds (Urquhart, 2002).

The diversity issue is a growing one since more and more school districts are experiencing an increasing population of students from minority groups. More suburban schools are enrolling more Latino and African-American students than ever before (Hodgkinson, 2002). If principals see the increase in the diversity as



an opportunity to create a rich learning experience for all students, the possibility for raising scores and improving student achievement is enhanced (Urquhart, 2002).

Richard Rothstein (2004b) suggests that two important factors influence the gap between the achievement of high poverty minority students and middle class white students. One is the need for after school activities that encourage learning and scholarship, and the other is infant and preschool care. Middle class children typically experience an early childhood marked by an intellectually rich environment. Once in the school years, those children participate in after school and summer programs that are stimulating. Rothstein feels that part of the answer for improving learning experiences for low-income minority students is to provide similar experiences for them. Early intervention is vital to closing the achievement gap.

Large schools with a diverse population are at a disadvantage in meeting the requirements of AYP. Because these schools have many and often large subgroups, they have increased targets to attain in order to meet AYP. They may be making substantial gains in student achievement; but if they cannot meet the needs of all students in all groups, they will be labeled as failures. Some charter schools have no subgroups so they do not face the daunting task of meeting multiple targets. Some critics of NCLB observe that the requirements for AYP encourage school districts to reclassify students to avoid creating a subgroup rather than creating methods to improve the achievement of those students (Socolar, 2004).

### *Limited English Proficiency (LEP) students*

Limited English proficient students often adversely impact test scores because they enter schools without a working knowledge of English. Without doubt, requiring a student who has not yet acquired skill in the language of the test to answer questions in a language foreign to them is a formula for disaster. Obviously, the student's knowledge of the test subject or the skills inherent in the subject is not tested. The test becomes an assessment of language skills, and the result will be failure (Abedi, 2004; Echevarria, 2006). In addition to the basic problem that these students cannot excel on a test because of the language barrier, they often do not possess the basic knowledge to succeed in school. Sometimes they have never attended school or cannot read or do even fundamental math or know how to behave in a classroom. Conversely, some students have had extensive training in their own countries and have a strong knowledge base but a limited vocabulary (Meyer, 2000). They also tend to move from district to district. Ironically, when they become proficient in the language and can be successful on the test, they are removed from the subgroup. Therefore, the subgroup does not improve because it is constantly renewed with students who are just beginning to learn the language. The fluid nature of this subgroup makes it a challenge for any school. Additionally, the numbers in this subgroup are occasionally so small that computing an accurate analysis is impossible. When scores are compared on a state-wide basis, some schools have a majority of students who fit this criteria while others have an insignificant number making comparisons faulty or ambiguous (Abedi, 2004).

Learning a new language is relatively easy for students in the early grades, especially in schools that use systematic approaches to learning reading. Using the language for conversation and social interaction is easier than learning academic English. The vocabulary is not as much a barrier as comprehending the meaning and nuances of the text. Comprehension is the foundation of standardized tests, so LEP students may function adequately in the classroom but fail on a state reading or math test (English Language Learners, 2004). Many students enter the system with a basic knowledge of social English but do not have the academic vocabulary necessary for success in the classroom or on a standardized test. Since students are expected to score at grade level on the state test, most LEP students fail (Echevarria, 2006).

Bilingual education is not available in many schools, and the law requires schools only to implement programs that provide language instruction (Wright, 2005). In order to improve overall scores, some states are developing ways to eliminate LEP scores from the overall scores reported to the state rather than developing programs to help these students (Wright, 2005).

The success of LEP students that leads to attaining AYP depends on three aspects: classification, instruction and assessment. School districts must carefully consider the language skills of students entering the system to understand the extent of the student's use and understanding of the English language in order to correctly classify the student. Teachers must be prepared to help LEP students with the unique problems they bring to the classroom. With the help of adequate instruction, students must overcome the language barrier to

attain the skill inherent in the lessons. Tests should be designed to accommodate the limits of the LEP student so the test evaluates the student's knowledge of the skill rather than their language proficiency (Meyer, 2000; Abedi, 2004).

Accomplishing this is difficult considering that fewer than 13% of teachers in the nation have had training for working with LEP students (Echevarria, 2006).

Some states are considering ways to accommodate LEP students by providing different testing systems for them. The alternatives include giving the test in the language of the student, using simplified English on the test, or using a language proficiency test for LEP students (Vu, 2006). The solution to the problem lies in providing students with learning conditions and test accommodations that will lead to success rather than searching for ways to exclude the scores (Vu, 2006).

#### School Building Characteristics

School building characteristics are those characteristics that relate to the school building. They are class size/pupil teacher ratio, attendance rate, disruptive behavior/discipline reports, dropout rate and school size.

#### *Class size/Pupil Teacher Ratio*

Logic would dictate that smaller classes would result in higher student achievement. Indeed most research points to academic gains when students learn in smaller classes. However, many questions remain about what constitutes a small class and how important the teacher is in making small classes successful. Typically, students in small classes enjoy more personal attention from the teacher and a more humane climate for learning. The

Tennessee initiative called the Student/Teacher Achievement Ratio (STAR) from 1985-1989 required classes from kindergarten to third grade to have 13 to 17 students in each class. The results showed significant gains in reading and mathematics. Students who began the program as kindergarteners and continued through third grade had the highest gains (Finn, 2002; Resnick, 2003; Nye, Hedges, & Konstantopoulos, 2004; Nye, Hedges, & Konstantopoulos, 2002). Various studies have examined the subsequent results of the Tennessee initiative and have concluded that students who had small classes in kindergarten through third grade continued to realize significant gains in reading and mathematics in all grades and all subjects (Finn, 2002). Girls typically realized more gains in small classes. Minority students and inner city students benefited more from small classes than white or non-urban students. Student enrolled in more years of small classes had the greatest gains. In fourth grade through eighth grades, the students continued to post gains in small classes (Resnick, 2003; Nye, Hedges, & Konstantopoulos, 2004).

In 1996 California initiated a program to limit kindergarten through third grade classes to no more than 20 students per class. The problem with the California plan was the need to hire 12,000 new teachers to fill the additional classrooms. Unfortunately, this led to an increase in the percentage of uncertified teachers, and the gain realized from smaller classes was erased by the lack of quality teachers (Finn, 2002; Resnick, 2003; Turley & Nadai, 1998; Johnson, 2002). An important component of small class size is the competence of the teachers. Consistently, research shows that teaching strategies that complement

a smaller class must be implemented, and teachers must be adequately prepared and supported with professional development for gains to be realized.

Conversely, analysis by economists such as Hanushek indicates a lack of significant improvement in student achievement for students in small classes. Critics of Hanushek point out that he limited his analysis to small samples or did not use controls for other school variables (Biddle & Berliner, 2002). Generally results for the early grades indicate that small class size does improve test scores, but gains for students in the upper grades and high school are more difficult to prove (Biddle & Berliner, 2002). Nye, Hedges and Konstantopoulos (2004) found that small class size especially benefits students in the early grades, minority students and disabled students. The gains, especially for minority students who experienced several years of small classes, continued in later grades particularly in reading although math also showed improvement. Several states have implemented policies to limit class size especially in the first three grades (Rothstein, 2004a).

Class size differs from teacher/pupil ratio because the latter is determined by dividing the total number of students in a school building with the number of faculty members. Because some staff members such as counselors or special education teachers have few or no students, the figures do not clearly reflect class size (Nye, Hedges & Konstantopoulos, 2004; Achilles, Finn & Pate-Bain, 2002). Research indicates that on the average the difference between class size and pupil/teacher ratio is ten. Therefore, if the pupil/teacher ratio is fifteen to one, the actual class size is 25 (Achilles, Finn, & Pate-Bain, 2002). This difference

impacts the research and perceptions of class size and its relationship to student achievement since some studies are based on pupil/teacher ratio rather than class size (Nye, Hedges & Konstantopoulos, 2004).

#### *Attendance rate*

Prior to 1996 few studies had specifically examined the effect of attendance on student achievement. The common argument focused on the importance of school inputs in general and had supporters as well as detractors. In 1996 Douglas Lamdin embarked upon a research project specifically designed to identify the impact of attendance on student achievement. His findings support what seems logical and that is that attendance does affect performance. He recommended implementing strategies that would improve attendance and subsequently improve test scores. Borland and Howsen (1998) suggest that Lamdin's results are inaccurate because he eliminated the impact of "student innate ability and competition" (p. 158) in his analysis of the data. They contend that the correlation between attendance and achievement is insignificant when this data is included. In rebuttal, Lamdin suggests that collecting attendance data for students over an extended period and including other variables would give a clearer picture of the relationship (Lamdin, 1996).

The extensive study conducted by the Chicago public schools in 1996 of the correlation between attendance and student achievement identified several factors. One major factor is that student absenteeism and truancy increases dramatically in high school. Some of the influences include the increased responsibility on the students for attendance and academic achievement. During

the elementary and middle school years, parents often provide transportation and monitor attendance and achievement; but when students enter high school, they may need to rely on public transportation and accept responsibility for their grades. The report indicated much higher attendance rates for the average eighth grader than for the average tenth grader who typically misses over six weeks of school each year (Roderick, 1997). Students who miss excessive days first semester tend to miss even more classes second semester. Additionally, students who score poorly on reading and math standardized tests typically have similarly poor attendance rates in high school (Knight, 2005).

In a study of the academic performance of students in a North Carolina district, Whitley (1999) discovered that students who are active in extra-curricular programs have a higher attendance rate and higher test scores than those who do not participate in activities beyond the classroom. The students who were in other activities had only one half as many absences as other students in the district. He concluded that regular attendance does enhance student achievement. Similarly being involved in extra-curricular activities improved attendance. Programs within the school that encourage extended day activities for students usually resulted in increased attendance and achievement (Roderick, 1997).

Many schools are using extrinsic rewards or incentives for students to improve attendance and ultimately improve achievement and test scores. The increased pressure to improve test scores has resulted in efforts in some low-income low performing schools to bribe students to attend school and increase



test performance. Offering prizes and similar incentives has not typically increased attendance and is inferior to creating an atmosphere where students want to attend and excel (Knight, 2005).

#### *Disruptive Behavior/Discipline reports*

Antisocial behavior, which disrupts the classroom and subsequently disrupts the learning process, has a negative effect on student learning. When considering end-of-the-year assessments, inattention and disruptive behavior resulted in lower scores for elementary students. The figures hold consistent for students in middle and high school (Dwyer, Osher & Warger, 1998). Finn, Achilles and PannoZZo (2003) indicated that a strong correlation exists between disruptive behavior and class size. Students in smaller classes with teachers who expected active student participation displayed less disruptive behavior and received fewer discipline reports. Similarly, the academic success of the students improved.

George, Harrower and Knoster (2003) studied four levels of behavior support to determine what strategies decreased disruptive behaviors and increased student achievement. They developed a six-step process to enable school administrators to identify focus areas and remedial techniques to help disruptive students. These steps address the problem on the school-wide level only; but generally if these remedies work, the problems at the other levels dissipate. The process focuses on prevention and early intervention to anticipate and eliminate problems before they develop. To develop the plan, the school

staff answers and researches questions that enable them to identify the process that will best address their individual situation.

Schools attempting to attain AYP must address the issue of disruptive student behavior since it influences the achievement of the disruptive student as well as other members of the class. Whether the cause of the behavior is clinical or lack of self-discipline, the effect on student achievement is undeniable (Lassen, Steele, & Sailor, 2006). When even one student in a class has behavior problems, all of the students are interrupted. Considering that as many as ten percent of United States students experience impaired academic achievement because of mental illness, many classrooms will certainly include disruptive students (Finn, Achilles, & PannoZZo, 2003).

Recent violent eruptions in schools have resulted in increased emphasis on punitive measures to curb disruptive behavior. However, these methods often do not result in decreased disruptive behavior and occasionally spawn additional outbursts. Proactive and preventative measures seem to meet with improved results as schools develop programs to help students deal with anger and frustration and to learn intervention strategies. As behavior improves, so does student achievement (Lassen, Steele, & Sailor, 2006).

Many of the students who are disruptive have not learned the social skills required to function in an educational setting. They often use the confrontational behaviors that they have learned at home in responding to authority. Therefore, the programs that are designed to help students identify the source of the anger or frustration and also to identify strategies for intervention are the most

successful in helping students resolve disruptive behavior problems and improve academic performance (Finn, Pannozzo, & Voelkl, 1995).

Scott, Nelson, and Liaupsin (2001) see a close correlation between disruptive behavior and academic failure. They researched the close connection between the anger and frustration that students experience because of academic failure and the punitive attempts to change the disruptive behavior. An emphasis on training teachers to use more effective teaching strategies to help students learn more efficiently was more successful than metal detectors and security guards. Efforts to prevent disruptive behaviors have met with greater academic gains than using punitive measures (Dwyer, Osher, & Warger, 1998).

#### *Dropout rate*

One way dropouts impact state test scores is that the scores improve when these students leave the system since typically students who drop out are low scoring students. Larger schools benefit more from a higher drop out rate because of improved scores. This reality occasionally tempts school districts to encourage these students to leave the system rather than to develop programs to encourage students to stay in school (Rumberger & Palardy, 2005; Roderick, 1995).

The reasons students give for dropping out of school are varied, but the most prominent reasons include students from a single parent family, students with low income and high mobility, and students who have experienced grade retention. Schools that have taken specific measures to support students in those

areas have improved the chances for the students to remain in school and succeed (Barton, 2006).

Looking at the dropout rate requires a consideration of the retention rate. The United States has a higher retention rate than any other industrialized nation. With a retention rate of 15-19%, the United States ranks with third-world countries like the Congo. Emphasis on the retention rate is important because students who are retained for one year face a 40-50% increase in the chances that they will drop out. Retaining students for two years increases that percentage to 90 if the retention occurs in middle school (Holmes, 2006). Schools seldom provide any additional help for students who are retained. They usually just experience another year of the same problems. As a result, students are dropping out of school at an earlier age creating a ninth-grade bulge in many schools (Barton, 2006). The drop out rate for minorities increases with retention, and the retention rate for minorities is high (Retention policy fails, 2004).

The alarming increase in the number of students who are retained in the ninth grade is feeding the dropout rate. Although many of the dropouts earn a GED, they are still at a disadvantage economically. Instead of allowing students to drop out and celebrating the improved scores, schools need to include these at-risk students in their reform efforts and provide viable educational opportunities for them. The most successful programs provided additional help for students through tutoring or classroom aides rather than or in addition to retention (Barton, 2006). Ironically, retaining students generally results in large gains in test scores since the older students are compared with a younger class

and the older class has fewer low scores. However, this figure is deceptive because it results in a higher percentage of dropouts (Holmes, 2006).

Rumberger and Palardy (2005) found that schools with a high percentage of students who do not feel safe in school and schools with a high proportion of class disruptions tend to have a higher dropout rate. They also discovered if teachers maintain high expectations for students, the dropout rate diminishes. Whitley (1999) reported that being involved in an extracurricular activity improved the chances for a student to remain in school. For example in his study, the dropout rate for athletes was 2% compared with 9.2% for non-athletes.

NCLB requires schools to improve their graduation rates. Schools cannot reach AYP unless graduation rates increase and consequently dropout rates decrease. Allowing students to drop out to improve test scores is no longer a viable option. However, one complexity within the issue is the fluidity of the numbers which identify the dropout rate. Often schools do not know what has happened to students who leave the system. They may attend another school, or they may return later but still be counted among the dropouts. Most schools do not have the resources to find each student. The graduation rate is not the only indication of the success of a district. Most states calculate the number of students who go on to a two- or four-year college. However, some states such as Missouri also track students who enter the military or receive vocational training (Mantel, 2005).

### *School size*

Fewer schools, larger schools, more economically efficient schools—that has been the direction for public schools since the late 1940s. Partly as a response to Conant's book *The American High School Today*, schools in the late 1950s were consolidated throughout the United States resulting in an 87 per cent decrease in the number of schools in the nation. Desegregation resulted in additional consolidation (Cotton, 1996). The era of the small neighborhood school was all but forgotten.

Today, however, researchers are beginning to look at the advantages of the small school, and many of them have determined that students achieve better in a small school setting. The precise definition of a small school is an illusive concept. The numbers range from 100 to 1000 depending on the research study. The majority of the researchers agree with the figure of anything smaller than 1000. The most efficient size for a small school is between 600 and 900 for high schools and 300 to 400 for elementary schools (McRobbie, 2001). A research project conducted by Public Agenda in 2001 found that the public perception of small schools was that they were safer, had more community and parent involvement, provided smaller classes and had lower dropout rates. Despite these perceptions, over half of the parents in the survey said that they did not consider the size of the school in selecting a school for their children (Johnson, 2002).

Most research indicates that student achievement either remains constant when comparing small schools to large ones or that students achieve better in a

small school setting. Minority and low income students show the most improvement in small schools. The drop out rate in small schools tends to be lower and the graduation rate higher. Although larger schools may be more cost effective, smaller schools realize more success with students (Cotton, 1996; Maine's Small Schools, 2005). For small schools to be most effective, they need to avoid trying to imitate the structure of large schools and design a plan that meets the needs of their students. A different mind set is essential for a small school. Just as smaller classes require different teaching methods, small schools must organize around a plan that reflects the benefits of a small community (McAndrews & Anderson, 2002).

The mindset for many years was that bigger was better, or at least cheaper. However, with the growing evidence that smaller schools bring higher scores, many districts are considering developing small schools-within-a-school. This is more cost effective than building and staffing small schools, and it addresses the need to improve student scores. Interest in creating small learning communities within larger buildings emerges from the need to pool resources in a large school and at the same time offers students the safety, security and achievement advantages of a small school. Some of the designs for school-within-a-school center around a specific grade such as ninth grade communities or around at-risk students. Other possible organizational patterns include career and academic choices, new students and advisory systems. Several organizations are providing funding to encourage school districts to develop smaller school communities (McAndrews & Anderson, 2002).

Rumberger and Palardy (2005) found that schools of 1500 or fewer are not more effective than mid-sized schools with 600 to 900 students. In fact, larger schools were more successful with student learning even though they had higher drop out rates. However, that statistic may be the basis for higher learning rates since the lower achieving students do not remain in the system.

### Summary

As the nation places more emphasis on accountability, the nation's school districts must examine new ways to improve student achievement. Emphasis has switched from inputs to outputs. With the demand from NCLB for proficient scores from all students including subgroups by 2014, districts must focus on improving standardized test scores. Missouri school districts work with the Missouri School Improvement Program to develop Comprehensive School Improvement Plans to help the district identify ways the district can enhance student learning and improve scores and attain AYP,

Of the many school variables that influence student achievement, the one that has the highest impact on student achievement is a highly qualified teacher. Other variables can influence student achievement. Small class size lends itself to improvement especially in the early grades and for low income and minority students. Similarly students who attend school regularly, select challenging courses and participate in extra curricular activities tend to achieve more. None of these variables can match the improvement possible with a highly qualified teacher in the classroom.



Conversely, students from low-income, limited English proficient or minority groups generally have lower scores and higher retention and drop out rates. They typically attend schools with lower per pupil spending and higher percentages of uncertified or out of field teachers. Since NCLB requires all schools to meet the same high standards, schools with large numbers of disadvantaged students who represent the various subgroups must find new ways to encourage students to attend school and excel academically. Many school districts have accomplished significant improvement in student performance, but they still must strive to meet AYP requirements.

## CHAPTER 3

### RESEARCH DESIGN AND METHODOLOGY

This chapter reviews the problem and purpose of this study as well as research questions and hypotheses. The methodology used to investigate each research question is explained. The population, method of data collection and instrumentation are identified. The independent and dependent variables and how the data will be analyzed are also included.

#### Statement of the Problem

Numerous studies have been done at the state and national levels to identify the relationship between student achievement and selected district variables. One major national study by Darling-Hammond (2000) correlated teacher quality variables, financial variables, school variables, and student variables with student performance at the national level using National Assessment of Educational Progress (NEAP) results. Few studies have been done using a variety of variables at the school building level; therefore, this study looks at the way school building personnel are held accountable based on selected variables that were used by Darling-Hammond; but instead of state level variables, this study focuses on Public School Building Profile variables in the state of Missouri and the differences between school buildings that make adequate yearly progress (AYP) and those that do not.

#### Purpose of the Study

Since Missouri individual school buildings are held accountable for student performance using AYP, the purpose of this study is to determine which Missouri

Department of Elementary and Secondary Education (DESE) Public School Building Profile variables can be used to describe the difference between school buildings that make AYP and those that do not (i. e. AYP Determination).

#### AYP Determination Policy

AYP Determination, as decided by Missouri DESE, is defined as to whether a school building makes AYP or not. The following factors are used in making the determination. All public school buildings in Missouri are required to administer either the Communication Arts (CA) and/or the mathematics Missouri Assessment Program (MAP) test. During the 2004-2005 school year, the CA test was administered in grades 3, 7, and 11. The mathematics test was administered in grades 4, 8, and 10. The percentage of students that score at or above the proficient level on these MAP tests is used to determine if a school building makes AYP or not. Each year the benchmarks increase to ultimately meet the 100% goal in 2014. Each school building needs to meet the AYP benchmark. In addition, student participation at each school building must be at or above the 95% level. Graduation rates in high school buildings and attendance rates in elementary and middle school buildings are also part of the AYP determination (Beck, 2006; Abedi, 2004).

#### Research Questions

1. What are the measures of central tendencies and dispersion of the Missouri Public School Building Profile variables (n=14) organized into two clusters, School Building Cluster (n=6) and Student Cluster (n=8), by AYP Determination?

2. Are there differences in Missouri Public School Building Profile variables between school buildings that make AYP and school buildings that do not make AYP (i. e. AYP Determination)?
3. What School Building Cluster variables (n=6) discriminate between school buildings that make AYP and those that do not?
4. What Student Cluster variables (n=8) discriminate between school buildings that make AYP and those that do not?

#### Research Null Hypotheses

1.  $H_0$ : There are no significant differences for Missouri Public School Building Profile variables (n=14) between school buildings that make and AYP and school buildings that do not make AYP.
2.  $H_0$ : No variables from the School Building Cluster (n=6) discriminate between school buildings that make AYP and those that do not.
3.  $H_0$ : No variables from the Student Cluster (n=8) discriminate between school buildings that make AYP and those that do not.

#### Research Design

The proposed study uses non-experimental causal comparative case study strategies (Patten 2002; Vogt, 1999). The study will be limited to publicly accessible data at Missouri DESE from the 2004-2005 school year. The independent and the dependent variables are discussed below.

### *Independent Variable*

A school building's AYP Determination is used as the independent variable. AYP Determination is nominal data and is divided into two groups; made AYP and did not make AYP. AYP Determination is the output variable.

### *Dependent Variables*

The dependent variables are Public School Building Profile variables. The Public School Building Profile variables have been divided into two clusters (See Table 3). The first group of dependent variables has been assigned the name School Building Cluster. The School Building Cluster describes six aspects of student population arrangements in each school building. School Building Cluster variables are (a) pupil to teacher ratio, (b) class size, (c) attendance rate, (d) discipline reports, (e) dropout rate, and (f) school size. These variables were chosen because they are similar to the ones used in the Darling-Hammond (2000) study and are throughput variables.

The second group of variables has been named Student Cluster. The Student Cluster describes the demographics of the students attending the school building. Student Cluster variables are (a) free/reduced lunch, (b) limited English proficient (LEP) (c) students with disabilities, (d) Asian, (e) Black, (f) Hispanic, (g) Indian, (h) white, (i) level not determined (LND)-Math, and (j) level not determined-CA. These characteristics are socio-economic and cultural and are input variables. The student cluster variables were selected because they are the groups that Missouri DESE uses to calculate AYP. This study observes and describes the School Building Cluster and the Student Cluster variable

differences between schools by AYP determination. According to Missouri DESE, LEP and student with disabilities data are not available at the building level at this time.

### Population

Missouri DESE is required by law to collect and maintain all information for public school buildings in the state. All data are available to the public. Data from all reporting public school buildings were used in this study (N = 2027). Inclusion of all public school buildings eliminates sampling error. See Table 4 for the frequency and percent of school buildings that make AYP and those that do not.

Table 4

*Frequency of Public School Buildings That Made AYP and Those That Did Not*

AYP Determination (N=2027)	Frequency	Percent
Made AYP	1332	65.7
Did not make AYP	695	34.3

### Data Collection and Instrumentation

Data for this study were obtained from archival publicly accessible records collected by DESE for each school building in Missouri during the 2004-2005 school year. An official of DESE prepared an electronic spreadsheet with the blinded data set (no school building names were provided) (L. A. Grant-Engle, personal communication, June 21, 2006). Districts are required to report the information for building variables to the state each year. DESE retains AYP determination information that is also of public record. Data other than school size and class size were expressed as ratios because of the differences in the sizes of school buildings. See Table 5 for variables and their data types.

Table 5

*Public School Building Profile Variables by Clusters*

	Data Type
<i>AYP Determination</i>	Nominal
School Building Cluster	
Pupil to teacher ratio	Ratio
Class size	Interval
Attendance rate	Ratio
Discipline reports	Ratio
Dropout rate	Ratio
School size	Interval
Student Cluster	
Free/reduced lunch	Ratio
LEP	Data not available
Students with disabilities	Data not available
Asian	Ratio
Black	Ratio
Hispanic	Ratio
Indian	Ratio
White	Ratio
Level not determined-Math	Ratio
Level not determined-CA	Ratio

Data Analysis

The data were analyzed using the Statistical Package for the Social Sciences (SPSS, 2005). To investigate research questions 1 and 2, descriptive statistics were used to describe and summarize the dependent variables. Means and standard deviations for each variable were reported (Huberty, 1994). An Analysis of Variance (ANOVA) was performed to eliminate any variables that had no significant differences between school buildings that make AYP and those that do not (Huberty).

To investigate research questions 3 and 4, discriminate analysis (DA), using Missouri Public School Building Profile variables, was used to describe differences between Missouri public school buildings that made AYP and those that did not (Huberty, 1994). As Huberty advises, only variables having a value more than one from the ANOVA should be considered significant for DA. All other variables may be eliminated before DA. All variables were retained because all had a value of more than one. Before DA was performed, outliers were identified. Only one or two outliers can affect the result of the analysis (Stevens, 1996). Some outliers are a result of recording, input, or measurement errors and should be disregarded if they cannot be corrected. Other outliers could be “true” outliers and may be of interest in what they reveal about the data (Pedhazur, 1997). All outliers were removed using a 0.95 confidence interval. Residual scatterplots were examined to test for normality and homoscedasticity. All variables were found to be normal. Levine’s test was performed for homoscedasticity, and all variables were found to be homoscedastic. Linearity was analyzed using a scatterplot (Mertler & Vannatta, 2001). See Figure 1 and Figure 2 in the Appendix A. Since all variables were found to be linear, no variables were converted to their natural logarithms.

Since only one variable was determined to be insignificant and it had an F-value greater than 1, all variables were retained. DA was performed to describe differences between those Missouri public school buildings that make AYP and those that do not. AYP Determination is the predictor of membership, and the



Missouri Public School Building Profile variables are the grouping variables (Mertler & Vannatta, 2001).

### Summary

The study provides both descriptive statistics as well as discriminant analysis. Missouri DESE provided the data for the year 2004-2005. Since school buildings are being held accountable for their AYP determination, this study describes the difference between school buildings that make AYP and those that do not. A complete analysis and interpretation of the data is provided in Chapter 4.

## CHAPTER 4

### PRESENTATION OF FINDINGS

Since schools are held accountable using Adequate Yearly Progress (AYP), this study focuses on the differences in schools that make AYP and those that do not using both Student variables and School Building variables.

Descriptive and comparative statistics are also included for schools by AYP Determination. All public school buildings with an AYP Determination were used in this study.

#### Research Question One

*What are the measures of central tendencies and dispersion of the Missouri Public School Building Profile variables (n=14) organized into two clusters, School Building Cluster (n=6) and Student Cluster (n=8), by AYP Determination?*

Descriptive statistics are used to portray the data from the schools for the 2004-2005 school year. The data is displayed for both those schools that made AYP and those that did not. The analysis results presented in Table 6 include number of schools, mean score for each variable and standard deviation.

The AYP determination shows that there are differences between those schools that made AYP and those that did not. In the School Building Cluster student-teacher ratio, class size, school size, discipline reports and dropout rate are all lower in schools that make AYP while the attendance rate is higher. Standard deviations are higher for schools that did not make AYP than they are for schools that did make AYP.

The Student Cluster analysis shows that schools that did not make AYP have a higher percentage of students on free/reduced lunch. One indication of a lower socio-economic school level is higher percentage of free/reduced lunch students. Schools that made AYP have a higher percentage of white students and a lower percentage of black students.

Table 6  
*Summary of Descriptive Statistics by Cluster and by AYP Determination*

<i>Clusters</i>	<i>Variables</i>	<i>Made AYP</i>		<i>Did Not Make AYP</i>	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
School Building	Student-teacher ratio	13.4	2.9	14.2	3.5
	Class size	17.3	3.4	18.5	4.4
	Attendance rate	94.9	1.5	92.8	3.9
	Discipline reports	1.2	1.1	2.9	2.8
	Dropout rate	2.5	1.5	4.0	4.0
	School size	339.1	196.0	561.8	439.3
Student (%)	Free/reduced lunch	45.9	22.0	50.5	24.1
	Asian	2.3	2.2	1.9	1.8
	Black	18.9	23.8	28.6	33.3
	Hispanic	3.0	3.9	3.2	5.5
	Indian	0.8	0.7	0.6	0.6
	White	83.3	23.6	70.1	34.1
	LND-Math	1.6	0.8	2.3	2.8
	LND-CA	1.9	1.1	2.4	2.5

Note:LND-Level Not Determined

## Research Question Two

*Are there differences in Missouri Public School Building Profile variables between school buildings that make AYP and school buildings that do not make AYP (i. e. AYP Determination)?*

An Analysis of Variance was performed to determine if there were significant differences between schools that made AYP and those that did not (Table 7). All variables were significantly different at  $\alpha=0.05$  except for the

Hispanic variable ( $p=.30$ ) from the Student Cluster. Most F-scores were much greater than one with the F-scores for attendance rate, school size and discipline reports greater than 100.

Schools that made AYP were significantly different from schools that did not make AYP. The most significant differences were in the School Building Cluster where all  $p$ -values were less than 0.01.

Table 7  
*Analysis of Variance to Show Differences between Schools That Made AYP and Those That Did Not*

Cluster	Variable	S/S	df	M <sup>2</sup>	F	p
School Building	Student-teacher ratio					
	Between Groups	263.8	1	263.8	28.02	0.00 *
	Within Groups	18810.9	1998	9.4		
	Class size					
	Between Groups	739.0	1	739.0	52.24	0.00 *
	Within Groups	28164.7	1991	14.1		
	Attendance rate					
	Between Groups	2058.3	1	2058.3	317.65	0.00 *
	Within Groups	12901.0	1991	6.5		
	Discipline reports					
	Between Groups	654.6	1	654.6	141.83	0.00 *
	Within Groups	4102.8	889	4.6		
	Dropout rate					
	Between Groups	206.3	1	206.3	18.42	0.00 *
Within Groups	5075.5	453	11.2			
School size						
Between Groups	22364507.2	1	22364507.2	245.57	0.00 *	
Within Groups	182601589.0	2005	91073.1			
Student	Free/reduced lunch					
	Between Groups	9713.6	1	9713.6	18.76	0.00 *
	Within Groups	1030373.7	1990	517.8		
	Asian					
	Between Groups	26.9	1	26.9	6.46	0.01 *
	Within Groups	4073.3	977	4.2		
	Black					
	Between Groups	65473.6	1	65473.6	86.26	0.00 *
	Within Groups	1147589.1	1512	759.0		
	Hispanic					
	Between Groups	21.9	1	21.9	1.08	0.30
	Within Groups	31961.8	1573	20.3		
	Indian					
	Between Groups	4.5	1	4.5	10.69	0.00 *
	Within Groups	394.6	929	0.4		
	White					
	Between Groups	74444.7	1	74444.7	96.45	0.00 *
	Within Groups	1422459.9	1843	771.8		
LND-Math						
Between Groups	51.0	1	51.0	9.62	0.00 *	
Within Groups	2844.5	537	5.3			
LND-CA						
Between Groups	42.9	1	42.9	10.16	0.00 *	
Within Groups	2561.4	607	4.2			

Note: \* Significant at or below p=0.05

### Research Question Three

*What School Building Cluster variables (n=6) discriminate between school buildings that make AYP and those that do not?*

A discriminate analysis (DA) was used to determine which of the School Building variables best discriminated between those school buildings that made AYP and those that did not (Mertler & Vannatta, 2001). One function named Student Engagement was generated and was significant,  $\lambda = .832$ ,  $\chi^2(6) = 59.596$ ,  $p < .001$ . Table 8 represents the discriminate analysis function for the School Building variables. In the original data 64.5% of the data were correctly classified. Schools that make AYP had a function mean of  $-.650$  and schools that did not make AYP had a mean of  $.308$ . These results suggest that schools of smaller school size, lower student-teacher ratio, lower discipline rate, smaller class size, and lower dropout rate and higher attendance rate are likely to make AYP. Figure 3 represents Function One as one dimension on the x-axis, showing that larger school size, higher student-teacher ratio, higher discipline rate, larger class size and higher dropout rate have a negative effect on AYP while a higher attendance rate has a positive effect on AYP.

Table 8

*Structure Matrix for Discriminant Analysis for School Building Variables*

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*Discriminant Function Table*

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Function	Eigenvalue	% of Variance	Wilks' Lambda	Chi-square	<i>p</i> value
1	0.201	100	0.832	59.596	0.000

---

*Variable/Function*

*Student Engagement*

---

School size	0.825
Student Teacher Ratio	0.670
Discipline rate	0.622
Class size	0.600
Attendance rate	-0.545
Dropout rate	0.441

---

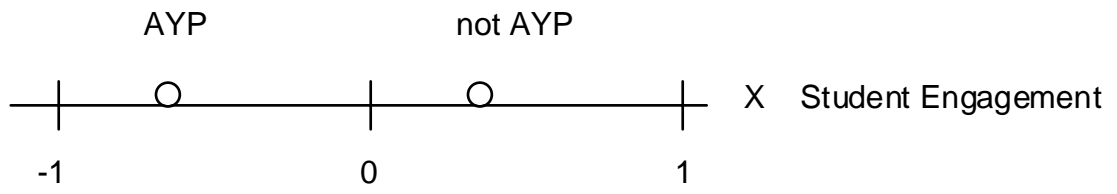
*Functions at Group Centroids by Discriminate Analysis for School Building Variables*

---

	Function
AYP Determination	1
Made AYP	-0.650
Did not make AYP	0.308

---

Figure 3. Centroid for school building variables function one





#### Research Question Four

What Student Cluster variables (n=8) discriminate between school buildings that make AYP and those that do not?

A discriminate analysis was used to determine which of the Student variables best discriminate between those school buildings that make AYP and those that do not (Mertler & Vannatta, 2001). Even though the Hispanic variable had a  $p$ -value of .30, it was retained for DA because its F-score was greater than one (Huberty, 1994). One function named Student Characteristics was generated and was not significant,  $\lambda = .940$ ,  $\chi^2(7) = 8.515$ ,  $p > .10$ . Table 9 represents the discriminate analysis function for the student variables. In the original data 56.3% of the data were correctly classified. Schools that made AYP had a function mean of -.498 and schools that did not had a mean of .126. These results suggest that student characteristics do not have a bearing on whether a school makes AYP or not.

Table 9

*Structure Matrix for Discriminant Analysis for Student Variables*

<i>Discriminant Function Table</i>					
Function	Eigenvalue	% of Variance	Wilks' Lambda	Chi-square	p-value
1	0.063	100	0.94	8.515	0.289

*Variable/Function**Student Characteristics*

White	-0.895
Black	0.882
Free/Reduced Lunch	0.832
Asian	0.328
Hispanic	0.280
LND-CA	0.247
LND-Math	0.245
Indian	0.006

*Functions at Group Centroids by Discriminate Analysis for Student Variables*

	Function
AYP Determination	1
Made AYP	-0.498
Did not make AYP	0.126

## Summary

Chapter four reported the analysis results for the four research questions. Data collected from the Missouri Department of Elementary and Secondary Education was used in this study. After statistical analysis, the findings were as follows:

1. There were significant differences in all School Building Variables between schools that made AYP and those that did not. Schools that made AYP had smaller school size, lower student to teacher ratio, higher attendance rate, lower discipline reports, lower dropout rate and smaller class size.

2. There were significant differences in all but one of the student variables between schools that made AYP and those that did not. Schools that made AYP had a lower rate of free/reduced lunch, a higher rate of Asians, a lower rate of Blacks, a lower rate of Indians, a higher rate of Whites, and lower rates of level not determined (LND). There was no significant difference in the Hispanic variable.
3. School Building variables as a cluster made a significant difference in whether schools make AYP or not. The most significant variable was smaller school size. However, lower student-teacher ratio, lower discipline rate, smaller class size, higher attendance rate and lower dropout rate were also factors in a school building making AYP.
4. The student cluster did not show a significant difference in whether a school made AYP or not. This suggests that the background and culture of the student population are not significant in whether a school makes AYP or not.

## CHAPTER 5

### FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

Chapter 5 reviews the research study analysis. An overview of the study is included followed by a summary of the findings for each of the research hypotheses. Chapter 5 closes with a conclusion answering each of the research questions along with recommendations and implications for further studies.

#### Overview

Since the passage of the No Child Left Behind Act in 2001, schools are being held accountable for outputs rather than inputs. Schools in Missouri are now held accountable for scores that students attain on the Missouri Assessment Program test. Each year an increasing percentage of students must score at the proficient or above level to make adequate yearly progress (AYP). Not only must the school as a whole meet this percentage, but subgroups designated by the state must also meet the percentage to attain AYP.

This study was done at the school building level. The data were collected from the Missouri Department of Elementary and Secondary for the year 2004-2005. All schools were included in the study. School building characteristics as well as student characteristics were involved in this study.

School building personnel are held accountable for student performance. The purpose of this study was to provide data to identify Missouri public school building profile variables that impact AYP status. The variables were divided into two clusters, school building variables and student variables. This study used discriminant analysis to describe membership in the group of school buildings

that made AYP and those that did not. These variables are similar to the student and school building variables used by Darling-Hammond (2002). Student variables were not included in the Darling-Hammond study but are included here because they are used in determining AYP status.

The conceptual underpinning in this study is accountability theory as set forth by Lerner and Tetlock (1999), Macpherson (1996), and Elmore, Abelmann, and Fuhrman (1996). The evaluation component of Lerner and Tetlock's (1999) accountability theory is now being applied to schools. Missouri schools are being held accountable using the MAP with consequences for not performing according to state standards. Each state must establish specified benchmarks for AYP and a system of sanctions (Missouri DESE, 2005). Schools are now being held accountable for outputs rather than inputs. Macpherson (1996) uses different terminology stating that client and technical theories have taken precedence over professional theory. Accountability has moved from process accountability to outcomes accountability (Fuhrman, 1999). Morgan (1997) also reflects the accountability theory being used in schools in his open system. He includes inputs and outputs but adds throughputs. Morgan identified not only inputs but throughputs as well. This process gives definition to what is controllable by the school building. Since schools are now being required to justify the scores of students and face penalties when those scores do not meet required levels, this study will focus on the differences between schools that make AYP and those that do not.

*Research Hypothesis One:  $H_0$ : There are no significant mean differences for Missouri public school variables between schools that make AYP and schools that do not make AYP.*

Descriptive statistics indicated that there was a difference between school buildings that made AYP and those that did not. The standard deviations were larger for school buildings that did not make AYP. Results of the Analysis of Variance revealed that all of the variables in the School Building Cluster were significantly different for school buildings that made AYP and those that did not. In the Student Cluster all variables were significantly different except for the Hispanic variable. Hypothesis One was rejected for all variables except for the Hispanic variable.

*Research Hypothesis Two:  $H_0$ : No variables from the school building cluster discriminate between schools that make AYP and those that do not.*

Discriminate analysis determined that the School Building cluster variables could be used to describe school buildings that made AYP and those that did not. One function was generated and was named School Engagement. The results suggest that smaller school size, lower student teacher ratio, lower discipline rate, smaller class size and a higher attendance rate are more likely to be classified as made AYP. Since school personnel are held accountable, they have a professional responsibility to make a difference in the school environment. Hypothesis Two was rejected.

*Research Hypothesis Three:  $H_0$ : No variables from the Student Cluster ( $n=8$ ) discriminate between school buildings that make AYP and those that do not.*

Discriminate analysis determined that the Student Cluster variables could not be used to describe school buildings that made AYP and those that did not. One function was generated, but it was not significant suggesting that students' cultural and socio-economic backgrounds are not a factor in AYP determination. Hypothesis Three was not rejected.

### Summary of Findings

Significant differences were found in all variables, except Hispanic, between schools that made AYP and those that did not. Only School Building Cluster variables were significant in their ability to discriminate between schools that made AYP and those that did not. Of the School Building variables, school size was the highest ranked variable. Student Cluster variables were not significantly able to discriminate between schools that made AYP and those that did not. However, the ANOVA showed significant differences in all variables except the Hispanic group.

Professional theory of accountability would suggest that school personnel are responsible for controlling the school environment and creating an atmosphere where all students can learn. Even though AYP is an essential component of accountability, addressing the needs of all students leads to academic success.

### Conclusions and Recommendations

Darling-Hammond (2000) came to the conclusion that school building variables make a difference, and this study corroborates that conclusion. In this time of greater accountability for output, this study found that the throughputs or

the school building variables are the most significant. A summary of these finding is found in Table 10.

Table 10

Summary of Findings by Analysis

	Variable	Description	ANOVA	DA
School Building Variables			Significant	
	School size	Smaller	Yes	Yes
	Student Teacher Ratio	Lower	Yes	Yes
	Discipline rate	Lower	Yes	Yes
	Class size	Smaller	yes	Yes
	Attendance Rate	Higher	Yes	Yes
	Dropout rate	Lower	Yes	Yes
Student Variables				
	White	Higher	Yes	No
	Black	Lower	Yes	No
	Free/Reduced Lunch	Lower	Yes	No
	Asian	Lower	Yes	No
	Hispanic	Lower	No	No
	LND-CA	Lower	Yes	No
	LND-Math	Lower	Yes	No
	Indian	Lower	Yes	No

This study found that school building variables describe the differences between schools that make AYP and those that do not. Therefore:

- Smaller schools are higher achieving schools. School personnel need to find ways to create smaller schools or at least create an atmosphere of a smaller school. Large schools can be divided into smaller school-within-a-school situations to create greater community.
- Schools with smaller class size and lower student teacher ratio have higher student achievement although student teacher ratio made the more significant difference. Past research has also shown that small class size



makes a difference especially in the early grades (Finn, 2002). School personnel need to make every effort to place students in classes with smaller numbers where students can have a greater sense of belonging.

- School with a lower discipline rate have a higher level of achievement. Schools with fewer long-term suspensions are more likely to have students that achieve at a higher level. Students need to be in class where they have the benefit of teacher instruction and communication with other students. School personnel need to engage students in such a way that the students prefer to be in the classroom setting. Being at school is more beneficial than not being at school.
- Schools with a higher attendance rate have students with higher achievement. School personnel need to create an atmosphere of student engagement. Students need to feel that school is relevant and realistic.
- The dropout rate is significantly lower in schools with high achievement. . Schools with a lower dropout rate are more likely to have students that are higher achievers. Again, keeping students in school is important. Some schools have encouraged lower student achievers to dropout, but this study shows that developing programs to encourage students to stay in school is more likely to create a high achieving school.

All of the school building variables were found to make a significant difference in the ANOVA as well as the discriminate analysis. School personnel need to take an overall look at their school and make sure that programs and policies engage students in relevant and realistic activities. Some of these factors

are financially driven. School personnel need to find ways to either increase funding or reallocate funds to make sure that students are in situations where they are engaged and feel a sense of community.

In the discriminate analysis the student variables were not significant in describing the differences between schools that made AYP and those that did not, therefore; working with all students to improve achievement is essential. However, in the ANOVA all student variables except Hispanic were significantly different. Black, white, free/reduced lunch populations showed the most significant differences

- Schools with a higher white population are more likely to be high achieving schools while schools with higher black and free/reduced lunch populations are likely to be low achieving schools. Other research agrees with these findings and indicates that generally the schools with the higher black and free/reduced lunch populations have fewer qualified teachers and lower allocations of resources (Darling-Hammond, 2000). Rather than wishing for a different clientele, school personnel must discover what programs and strategies can work with students in the school. Meeting the needs of the students who enter the school and recognizing ways to make academic success meaningful and attainable seem to be the correct course.
- Higher percentages of Asian and Indian groups translate into lower achievement. Even though their numbers may be small, these subgroups cannot be neglected. All students need to be academically successful.

- Students that do not take or finish the test significantly impact student achievement negatively in both CA and math. Since these students are probably among the group of students that do attend school on a regular basis, they not only lower the attendance rate but significantly impact achievement as well. School personnel need to ensure that students attend school especially during the testing window. Extrinsic rewards can be used, but a better solution would be to engage students in the learning process by making school realistic and relevant.

#### Implications for Further Study

To further investigate accountability for all schools, an individual study could be done with elementary, middle and high school levels. Since the school factors are different for each level, variables could more narrowly define the particular actions needed at each level.

Another study could examine the data over a period of several years. School buildings may or may not be making a difference over time. Resources need to be allocated to programs that are making a consistent difference.

Since the test and the scoring of that test changed for the 2005-2006 school year, another study could be done to see if this study can be corroborated with somewhat different data. The school building variables and the student variables could remain the same.

#### Summary

The analysis of the School Building and Student data from Missouri Department of Elementary and Secondary Education, 2004-2005, showed

significant differences in schools that made AYP and those that did not.

However, only the School Building variables discriminated between the schools that made AYP and those that did not. This study should give school personnel the impetus to make changes at the building level to better meet the needs of all students.

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## APPENDICES

## APPENDIX A

### Scatterplots Figures

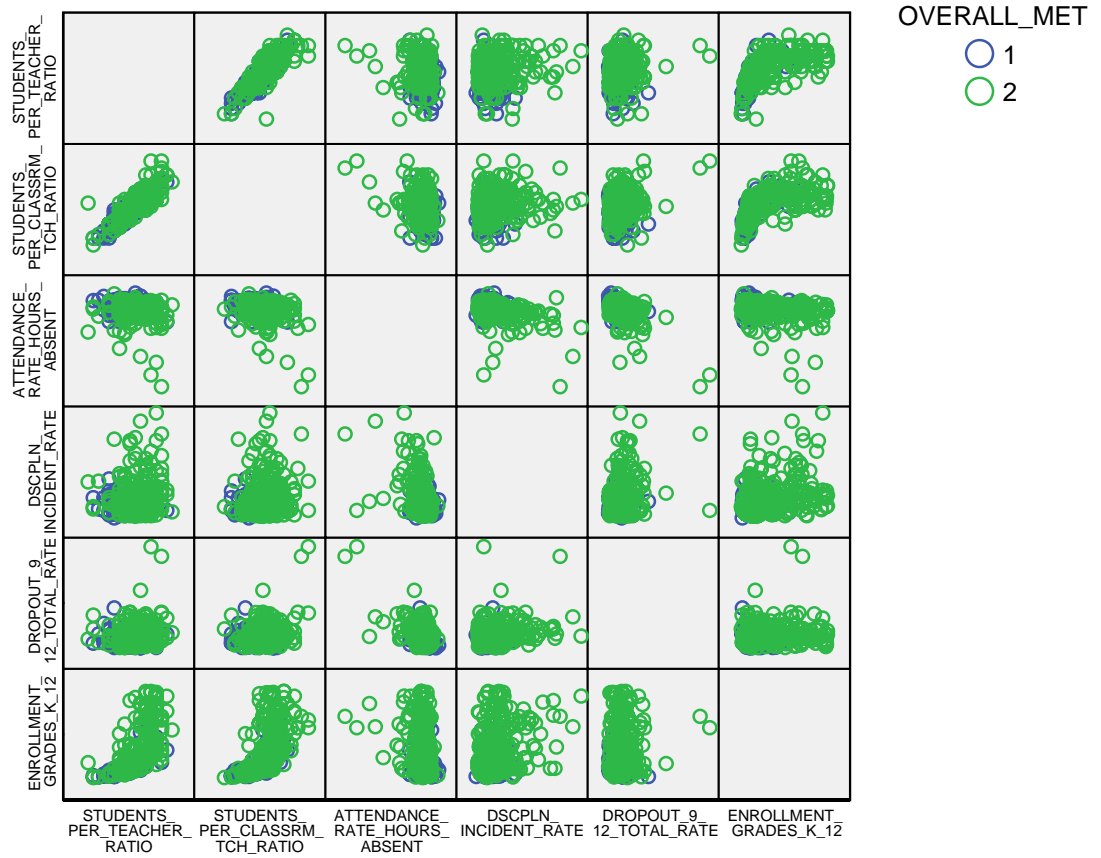


Figure 1. Scatterplot to determine linearity of variables in the school building cluster.



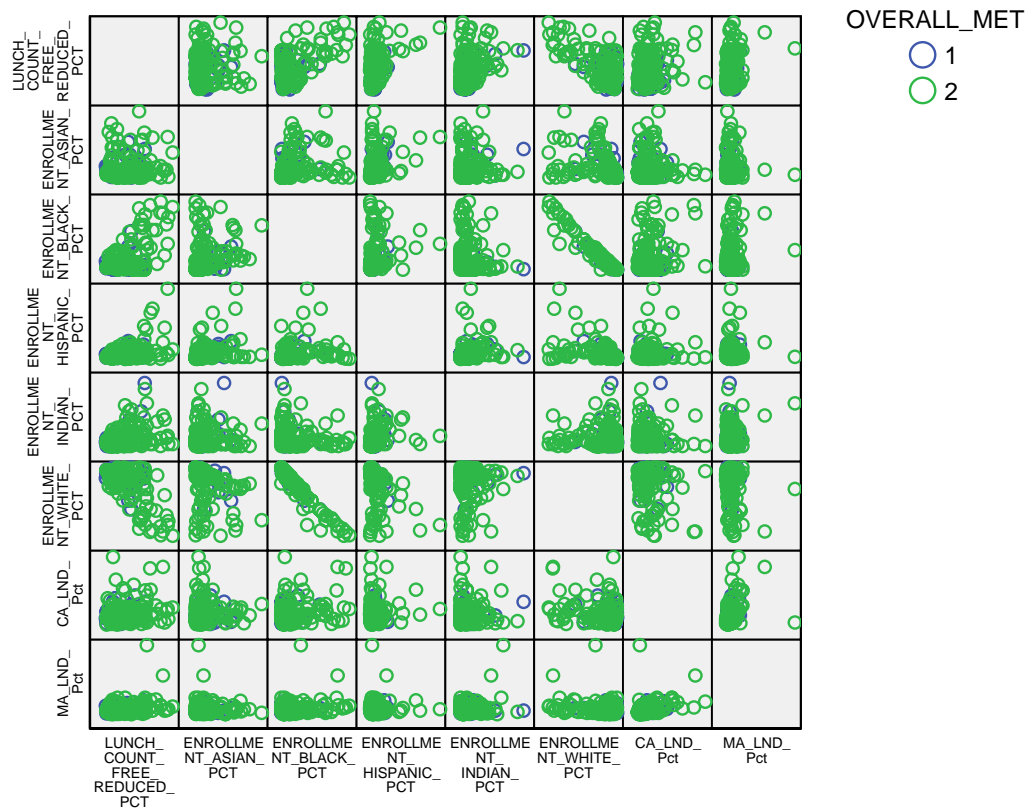


Figure 2. Scatterplots to determine linearity of variables in the student cluster.

## APPENDIX B

### Letter of Support

Date: June 21, 2006

RE: Data for Linda Stenger's Dissertation

Linda Stenger has contacted the Department of Elementary and Secondary Education in regards to the availability of data she will need to complete her dissertation. The information she needs is available and considered to be public information (District and Building summary data in regards to AYP status and additional demographic information) so there is not a need for a non-disclosure agreement to be completed. I will also be glad to help her access the information and organize it in a format desired as she completes her dissertation.

Please let me know if you need any further information.

-- Leigh Ann

Leigh Ann Grant-Engle, Data Manager  
Missouri Department of Elementary and Secondary  
Education

Email: [leighann.grantengle@dese.mo.gov](mailto:leighann.grantengle@dese.mo.gov)

Phone: 573.522.8310

Web: <http://dese.mo.gov/>

Vita

## VITA

Linda S. (Hoffelmeyer) Stenger was born in St. Joseph, MO on March 6, 1946 and is the oldest daughter of Floyd (deceased) and Marge Hoffelmeyer. She was graduated from NWMSU with a Bachelor of Science in Education with a major in mathematics and a minor in library science. In 1985 she received her Master of Arts in School Computer Studies from NWMSU. In 1999, she began her work on her doctorate in Educational Leadership and Policy Analysis from the University of Missouri. The degree was awarded December 15, 2006.

Currently Ms. Stenger is employed by the North Kansas City School District teaching mathematics at North Kansas City High School. Previously, she was employed by the St. Joseph School District and the Boulder Valley School District. Linda resides in Kansas City, MO. Her son, Geoffrey Lambright is a CPA with Deloitte and is married to Jennifer. They have a son, Christopher, who is the light of her life.