SCHOOL LEVEL FACTORS ASSOCIATED WITH PENNSYLVANIA HIGH SCHOOLS THAT EXCEED PVAAS GROWTH PROJECTIONS IN READING

A Dissertation in
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by

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ABSTRACT

An abundance of research exists related to student and school factors that influence student achievement; however, due to the increase in value-added assessment models and the number of states that are instituting such models, there is a significant need to investigate school characteristics and programs that promote academic growth as measured through value-added analysis. The research study was an effort to explore programs and characteristics common among high schools in Pennsylvania that issue reading growth projections provided by the Pennsylvania Value-Added Assessment System. High growth reading high schools were identified using Average Growth Index (AGI) scores. Sixty-five high school principals working in these high reading growth schools completed a survey and provided insight into those characteristics and programs in their schools that promoted reading development. Six onsite visits were completed and personal interviews were conducted with principals of these high growth schools to develop information regarding what these schools did to attain such positive results. Additionally, a multiple regression analysis was conducted to determine if there was a relationship between a school’s three-year mean AGI score and several variables. Results of the study concluded that high schools that exceed PVAAS reading projections contained the following characteristics and/or programs: (a) had remediation and/or tutoring programs in place for students who are not meeting the prescribed academic standards, (b) obtained, reviewed, and utilized student data to maximize the learning potential, (c) utilized a focused approach to staff development, and (d) had high expectations for student achievement as shared by the community, parents, staff, and students. Regression analyses showed that Graduation Rate, “Other” Race, Percentage of Low Income Students, Number of Students, and Math Growth Indexes demonstrated a relationship to the reading growth scores in Pennsylvania high schools.
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CHAPTER 1: INTRODUCTION

Assessment and evaluation have become the two fundamental principles by which educators assess academic performance because of the prevailing high stakes testing needs and accountability environment currently in place. With the inception of the No Child Left Behind (NCLB) federal legislation in 2001, school districts and states have been forced to review and redesign many of their instructional and assessment procedures to comply with the NCLB mandate that all students are to be proficient in math and reading by the year 2014.

“Accountability, a dominant theme of this legislation, requires all states to develop accountability plans that measure the effectiveness on each public school, primarily through student achievement test score data” (NCLB, 2003a). The focus of the Mixed Methods study was to identify the programs and characteristics that are present in those high schools that have exceeded the Pennsylvania Value-Added Assessment System (PVAAS) projections for reading progress for students in eleventh grade.

**Background of the Study**

One feature of the emerging national commitment to the accountability model is the growing prominence of high-stakes testing (Borg, 2007). “High-stakes tests are tests from which results are used to make significant educational decisions about schools, teachers, administrators, and students” (Amrein & Berliner, 2002b, p. 5). Amrein and Berliner did not investigate the programs or characteristics of schools that have exceeded test projections. NCLB legislation requires all 50 states to test students annually in specified grade levels in the areas of mathematics and reading. Amrein and Berliner (2002a) reported a number of states have programs that (a) distribute financial rewards to successful or improved schools, (b) have the power to close, restructure, or take over low-performing schools, (c) award financial bonuses,
or displace or remove teachers or administrators. Further, some states and school districts require students to be proficient in the math and reading standards (as measured by the high-stakes state exam) to graduate from high school (Amrein & Berliner, 2002a).

The use of student achievement data for decision-making is currently a focus of school and district reform efforts across the United States (U.S.). Emphasis on data has grown as result of an increasing emphasis on using test scores to evaluate school performance, a use that is central to the No Child Left Behind Act (NCLB) accountability provisions (McCaffrey, 2007). McCaffrey did not explore the programs or characteristics of schools that exceeded anticipated test results. The broad implementation of standards-based accountability under NCLB has presented new opportunities and incentives for data use in education by providing schools and districts with additional data for analysis, as well as increasing the pressure on them to improve student test scores (Massell, 2001). Massell did not include a survey of schools that exceeded predicted norms in the study. The concept of Data–Driven Decision Making (DDDM) in education is not new and can be traced to the debates about measurement-driven instruction in the late 1980s (Popham, 1987; Popham, Cruse, Rankin, Sandifer, & Williams, 1985). DDDM uses assessment data at both the individual student and school levels to identify academic strengths and deficiencies.

Often, the analysis of the data leads to curriculum and instructional modifications in schools. As a result, data are becoming more abundant at the state, district, and school levels, and some suggest educators are “drowning” in too much data (Celio & Harvey, 2005; Ingram, Louis, & Schroeder, 2004). Although few systematic studies have been conducted to examine the effectiveness of data-driven decision-making on a large scale, there is some evidence that the use of data can lead to an improved school culture and can contribute to student learning
(Feldman & Tung, 2001).

In the state of Pennsylvania, public school systems have been administering the PSSA for many years. The PSSA is a state mandated test for grades three through eight, and eleven that assesses academic achievement in mathematics and reading. Students are also required to take a PSSA writing assessment in grades five, eight, and eleven. The PSSA Science Assessment has been administered to students in the fourth, eighth, and eleventh grades since 2008. Although the PSSA has always been an important assessment in Pennsylvania, its accountability and scope of measurement has dramatically increased over the years.

When academic standards in Pennsylvania were adopted and implemented in 1999, schools faced a new level of accountability and scrutiny. The media began publishing PSSA scores and ranking schools and districts on the basis of this one test. Additional pressure mounted as schools received bonuses or sanctions based on their PSSA results. PSSA reports have evolved throughout the years and now provide comprehensive data at the district, building, and individual student level. Students are assessed and given a score (performance level) for each reading and mathematics standard. In addition to these individual student scores, results are also disaggregated and reported to schools in the following subgroups as required by NCLB: economically disadvantaged, race/ethnicity, gender, disability, and limited English proficiency.

NCLB was the first major change in federal education law in almost thirty years. Although, the U.S. government’s role in education is not mentioned or defined in the constitution, most public schools receive Title One funding from the federal government and, therefore, are required to implement federal education policies and regulations in order to continue receiving that funding. The NCLB law requires that all students in all states be tested annually in math and reading in the third to the eighth grade. As previously mentioned, this
federal legislation requires that all students perform at or above the proficiency level in math and reading by the year 2014. School districts that do not meet AYP standards face stiff sanctions and penalties. These sanctions include placing the school on a warning list, developing an intensive school-wide improvement plan, dismissing the building principal, and removing the teachers.

In response to NCLB, most states have developed their own assessments that are administered to pupils each school year. Similar to Pennsylvania, the results of the assessments are then provided to school districts in the form of a report. These reports typically contain raw student achievement scores that are grouped by schools and specified subgroups. These data are helpful in determining which schools, students, and subgroups are not performing at the proficient level. “However, raw achievement scores do not provide information that can help determine whether students are making progress as a result of what the school or teacher is doing” (Hershberg, Simon, & Lea-Kruger, 2004, p. 27). Hershberg et al. did not examine the programs or characteristics of schools that exceeded expectations. As a result, researchers have developed an alternative approach to measure accountability called “Value-Added Assessment.”

**Value-Added Assessment**

“Value-added assessment (VAA) focuses on gains in academic achievement over a given year that can be attributed to a district, a school, or an individual teacher. Those gains are the ‘value’ that teachers, schools and districts add” (Zurawsky, 2004, p. 1). Zurawsky did not investigate the programs or characteristics of schools that exceed expected projections. Unlike the traditional and more commonly used “cohort-to-cohort gain” approach that is used to compare cohorts of students in a given grade with previous cohorts in the same grade, the value-added model tracks individual students over time to measure their academic growth over a
minimum of a three-year span. Although a variety of analyses falling under the banner of value-added analysis have been in place, it is the Tennessee Value-Added Accountability System (TVAAS) developed by Sanders (1998) that is the most well recognized and first system to have been employed by an entire state (Ceperley & Reel, 1997).

TVAAS is implemented with mixed-model equations as the statistical methodology to analyze student outcomes from standardized assessments collected from individual students over time (Doran, 2003b). Although the formula may be complicated for the layperson, Sanders attempted to simplify the process by equating it with the example of parents charting a child’s physical growth. When a parent measures a child’s height against a wall at various ages, he or she is able to chart or measure growth (value) that the child has made in a designated amount of time. Also, based on average growth rates, the same parent can make a fairly accurate prediction of the child’s expected growth 6 months or 1 year ahead. Sander’s formula (1998) consisted of a longitudinal analysis (3 to 5 years) of student achievement data that is received from the Tennessee Comprehensive Assessment Program (TCAP).

Value-added analysis purports to statistically control and account for variables such as student race and socioeconomic status with which to eliminate these influences on student learning so academic growth can be directly attributed to the effects of the school and teacher. The longitudinal data accumulated over time form a model for a student’s learning patterns and makes it possible to ascertain when a student’s academic growth has been hindered. TVAAS purports to have the ability to measure a school district, school, or individual teacher’s effectiveness or ineffectiveness based on student learning (Olson, 2002). Due to the amount of data that TVAAS has been able to provide to the state of Tennessee, other states are
incorporating value-added measures. Twenty-one states, including Colorado, Ohio, and Pennsylvania, are experimenting or using the TVAAS model (Olson, 2002).

**PVAAS**

Pennsylvania is currently one of 21 states implementing a value-added model, which is referred to as the Pennsylvania Value-Added Assessment System (PVAAS). PVAAS is currently in its eighth year of implementation and is based on the TVAAS model created by Sanders. The Pennsylvania State Board of Education adopted a value-added approach in 2002. During the 2002-2003 school year, 31 school districts were selected to pilot PVASS in Phase 1 of a 4 year implementation process. Twenty-two school districts were selected to pilot PVAAS in Phase 2 during the 2003-2004 school year. Sixty additional Pennsylvania school districts were added in Phase 3 of the piloting-project in 2004-2005. The remaining school districts joined PVAAS in the 2005-2006 school year.

Using data from the PSSA, the state has developed a database that contains achievement data for all students in the state. Pennsylvania has contracted directly with Sander’s (1998) company, SES Inc., to provide an analysis of the PVAAS data and then provide web-based detailed value-added reports to the school districts (Pennsylvania Department of Education, 2004a, 2004b).

Kupermintz, from the University of Colorado, expressed concern regarding the limited amount of peer-reviewed literature that is available on VAA, particularly Sander’s (1998) TVAAS model. On the subject of teacher effectiveness he noted, “it is surprising to find that research findings from TVAAS that specifically pertain to claims regarding teacher effectiveness have been discussed in only three peer-reviewed journal articles, two book chapters, and three unpublished research reports, all of them authorized by TVAAS staff.”
Another criticism is the TVAAS bold claim that by using student prior achievement as a baseline, the model adequately accounts for all external influences such as socioeconomic status on student learning. In an example, using a large longitudinally-matched data set of fifth grade students in North Carolina, (Ladd & Walsh, 2002), reported sizable correlations between socioeconomic status and school value-added scores. It has long been asserted by educators and researchers alike that external factors such as socioeconomic status greatly impact student achievement and most would refute the claim that VAA can account for all variables outside the classroom.

Lastly, an implicit assumption of the TVAAS model is that teachers, not students, are responsible for learning and hold the responsibility to produce measurable progress in learning outcomes (Kupermintz, 2003). Although the quality and effectiveness of the classroom teacher on student learning and growth cannot be disputed, the TVAAS model assigns no accountability or responsibility to the student. It discounts the fact that some students simply refuse to put forth their best effort on test because there is no incentive for them. This inequitable distribution of accountability gives teachers full responsibility for the learning in the classroom and resolves students and parents from any responsibility.

Statement of the Problem

A review of the literature revealed an unbalanced and incomplete record of empirical research concerning the results of data from the PSSA on programs and characteristics of schools that produce test scores that exceed growth projections. The preponderance of research, which is examined further in Chapter 2 focuses mainly on student achievement factors, not academic growth. Although value-added assessment is gaining approval in many states as an effective, statistically proven, method of measuring student academic gains and teacher and school
effectiveness, there has been a lack of research investigating the programs and characteristics of schools whose students exceed PVAAS reading projections. Furthermore, the United States Department of Education has recently approved the use of growth models as an alternative method for states and school districts to demonstrate that their students are making Adequate Yearly Progress (AYP). Even though there has been a significant increase in the use of value-added models by state education departments and schools throughout the country to predict and measure student academic growth, it still remains a rather unknown phenomenon for most educators and there is a significant need to determine how schools can help students increase their academic performance by providing programs and supports that promote reading growth for all students.

**Purpose of the Study**

The purpose of the study was to identify the programs and characteristics that are present in high schools whose student reading test scores exceed the Pennsylvania Value-Added System of Assessment (PVAAS) projections for students in the eleventh grade and also determine if there is a relationship between several identified school variables and PVAAS reported growth. School level PVAAS reports are available to the public via the Pennsylvania Department of Education’s website for all schools and school districts in the commonwealth. For this study, the researcher was granted permission from the Pennsylvania Department of Education to access and utilize the PVAAS Growth Index scores for all Pennsylvania high schools based on the 2009, 2010, and 2011 PSSA reading results. An analysis of the three-year Growth Index data resulted in a list of schools that have exceeded PVAAS growth projections in reading over a period of time. Subsequently, principals at a representative sample of identified schools were interviewed to explore programs and/or characteristics that may account for the manner in which their
students have exceeded expectations.

The school-level factors and characteristics of schools that grow students in the area of reading beyond what is expected or predicted is of critical importance to educators and educational stakeholders who believe that all students can learn and become productive members of society. If it can be shown that specific school-level programs and educational practices lead to students growing at a level in reading that exceeds value-added projections, then these results could be reviewed and utilized by educators to implement similar programs in their schools to increase the academic growth of all students.

**Significance of the Study**

There is a need for this study because most of the value-added research to date deals with the effectiveness of the teacher and the use of the data for the evaluation of schools, and more specifically, teachers. A review of the literature revealed an incomplete and unbalanced body of knowledge about the programs and characteristics of schools that have exceeded growth projections in the state of Pennsylvania. Results of the study may provide valuable insight to educators in Pennsylvania about the programs and characteristics of school that have achieved beyond the projected reading standards enabling leaders to implement proven practices in their own schools.

**Research Question**

Based on the content of previous sections, the following research question drove the methodology of the study.

*RQ1: What programs and characteristics are common among the schools that exceed predicted academic growth in reading based on the PVAAS projections compared to actual PSSA scores?*
RQ2: Is there a relationship between reading PVAAS growth scores and the following school factors: percentage of special education students, percentage of low income students, graduation rates, school wealth, and race (White, African American, Hispanic and Other)?

In the PVAAS system, academic growth of a cohort of students is quantified using a growth measure that is provided to all Pennsylvania school districts. A cohort is any specified group of students – all students in a grade or all students in a demographic subgroup. Students in this study were assessed using their eleventh grade PSSA cohort results from the spring of 2009, 2010, and 2011. Academic growth or decline was calculated using the PVAAS growth index scores, which measure the difference between the school’s PVAAS predicted reading scores on the PSSA and the actual PSSA reading scores in 2009, 2010, and 2011. A three-year mean growth index score was calculated for each public high school in Pennsylvania and this score served as the school’s growth score for the study.

Nature of the Study

The foundation of the mixed methods study was survey responses and face-to-face interviews with school principals or other cogent school leaders in the top quintile of high schools exceeding projected test results in reading. A survey was administered to all public high school principals in Pennsylvania who had more than 100 students in their school’s junior class (the grade level that the PSSA is administered) and whose schools’ mean growth index score in reading fell into the top quintile in the state. Schools chosen for the interview portion of this study were purposively selected based on their proximity to the researcher’s home in Pennsylvania and fell within the top decile of Pennsylvania high schools using the PVAAS three-year mean growth index score. Only schools within a range of 100 miles from the researcher’s home in Central Pennsylvania were randomly selected for interviews with their respective
principals. Suzuki, Ahluwalia, Kwong-Arora, and Mattis (2007) asserted that the decision regarding the number of participants in a study is a reflection the study’s purpose. Creswell, Hanson, Clark, and Morales, (2007) suggested that 10 to 12 participants may prove sufficient in qualitative inquires involving the understanding of experiences and perceptions of participants. A successful purposeful sample in a qualitative study could range from 1 to 40 (Creswell, 2009), or from 5 to 25 participants (Polkinghorne, 1989). Interviews with 10% of the sample from the top decile PVAAS reading growth schools would result in a participant sample of 6 high school Principals.

**Definition of Terms**

**Average Growth Index (AGI)**

The Average Growth Index is a measure of student progress across the tested grade levels in a school. The index is a value based on the average growth across grade levels and its relationship to the standard error so that comparisons among schools are meaningful. PVAAS utilizes this index (based on the standard error) to allow for a view across schools. Its use is similar to the Consumer Price Index, a common scale used to provide comparisons. If the standard error is not accounted for, users might get a skewed picture of the relative effectiveness of different schools. For grades 9 through 11, the Average Growth Index is calculated by dividing the most recent year’s Growth Measure (difference between predicted and actual score) by the Corresponding Standard Error (PVAAS Public Site, 2011).

**AYP**

Adequate Yearly Progress (AYP), as part of the federal No Child Left Behind Act (NCLB), holds LEAs accountable to students, their parents, teachers, and the community. The purpose of AYP is to ensure that all students have reading and math skills that prepare them for
the future. The law states that all students must reach the Proficient level or higher in Reading or Language Arts and Mathematics by 2014. School districts and schools must show Adequate Yearly Progress on several measurable indicators: Attendance or Graduation Rate, Academic Performance, and Test Participation (PA Department of Education)

**Growth Measure**

The Growth Measure indicates how much movement a group of students has made on the Normal Curve Equivalent (NCE) scale (that ranges from 1 to 100) as compared to the previous year (all prior data is used to estimate previous year and current year’s performance). The Growth Measure is approximately the difference between the Estimated NCE Score from the most recent year and the previous year. However, the estimations are based on all longitudinal data, not just two scores. The Growth Measure provides educators with a measure of progress students have made in that grade level during the previous school year (or in the case of this study between the eighth grade administration and the eleventh grade administration of the reading PSSA). (PVAAS Public Site, 2011)

**Pedagogy**

This term refers to the traditional, didactic, teacher-led instructional form of education (Cochran-Smith, 1995).

**PSSA**

The annual Pennsylvania System of School Assessment (PSSA) is a standards-based, criterion-referenced assessment used to measure a student's attainment of the academic standards while also determining the degree to which school programs enable students to attain proficiency of the standards. Every Pennsylvania student in grades 3 through 8 and grade 11 is assessed in reading and math. (PA Department of Education, 2011)
PVAAS

PVAAS is a rigorous and robust statistical analysis of existing assessment data: data from PSSA Math, Reading, Science and Writing data for all students tested in the Commonwealth of Pennsylvania. PVAAS is a realistic measure of a school’s growth over time (PA Department of Education, 2010).

School Performance Score (SPS)

The SPS measures the performance of the school using attendance, drop out rate, standardized test scores, and percentage of highly qualified personnel (U.S. Department of Education, 2001).

Assumptions

Leedy and Ormrod (2005) defined research assumptions as self-evident truths. It was assumed that PVAAS accurately indicates student progress and school effectiveness. Another assumption was that the principals to be interviewed in the schools that exceeded the PVAAS projections would have the appropriate teaching license or would be highly qualified as defined by NCLB Act (U.S. Department of Education, 2001). The validity of the study was predicated on the assumption that the participants would answer truthfully and accurately to the interview questions based on their “personal experience” (Bruyn, 1966, p. 91). It was also assumed that the lived experiences of the participants in this study could positively contribute to leadership decisions and school programming that would ensure students continue to grow at the appropriate rate or exceed the projected growth rate in reading, which is an essential life skill (Thornton, Peltier, & Medina, 2007).

It was assumed that all participants would respond honestly and to the best of individual abilities. The study was not about individual school leaders, but instead was about the experience
of participants as they contemplated the factors they deemed important in the development of students’ reading skills as they progress through high school. It was assumed that the researcher would be unbiased. It was assumed that the interviews would reveal a common area of knowledge and that the participants would perceive the nature and significance of the study. The assumption was made that the data collection process using surveys and follow-up interviews would be a consistent and an accurate representation of each participant’s point of view.

**Scope, Limitations, and Delimitations**

The mixed methods study took place in Pennsylvania where there are 619 public high schools. Only schools that had more than one hundred students in grade eleven and exceeded the PVAAS reading projections as demonstrated on the eleventh grade PSSA reading results were included in the qualitative component of the study. All Pennsylvania high in which the researcher had the appropriate data sets (i.e., three years of Growth Index Scores and the respective predictor variables) were analyzed for the quantitative portion of the study. The researcher explored and identified the factors and characteristics found in schools that exceeded PVAAS projections. Principals in these outlier schools were surveyed and interviews occurred with principals in randomly selected schools. The interview protocol used contained a set of predetermined open-ended questions to ensure consistency across all interviews. Details of the protocol and procedure are in Chapter 3.

Creswell (2012) indicated limitations of a study determine inherent exceptions, reservations, and qualifications of the research. Recognized limitations identify potential weaknesses of a study (Creswell, 2012; Triol, 2006). The data from the study may not be characteristic of all other high schools statewide or nationwide.
Delimitations are limitations on the research design imposed deliberately by the researcher (Creswell, 2012). The study took place in the state of Pennsylvania. The context of the study concerned the exploration of characteristics and programs of schools exceeding state projected test scores for eleventh grade students. The study was confined to surveying purposively selected Principals or other cogent leaders such as school Counselors in these schools.

**Summary**

Chapter 1 was a presentation of the lack of information about the programs and characteristics of schools that exceed state test standards. The purpose of the study and the primary research question were cited. The research design was outlined, and will be discussed in greater detail in Chapter 3.

The following chapter is a discussion of value added assessments and related subjects. Chapter 3 is intended to provide the experienced investigator with enough data to replicate the study. The research approach and design are detailed, the participants and the questions involved in the semi-structured interview protocol are detailed, and the procedures to be followed in the collection and analysis of data are described. As well, ethical considerations and internal and external validity are discussed.
CHAPTER 2: REVIEW OF THE LITERATURE

While growth models have been used for decades in academic research and program evaluation, now a wide cross section of policymakers at local, state, and national levels are inquiring about the potential for growth models to provide an alternative or useful addition to the accountability systems that each state is implementing under the requirements of the No Child Left Behind Act (NBLC) (Goldschmidt et al., 2005). The study was an investigation to identify the programs and characteristics present in high schools whose student test scores exceed the Pennsylvania Value-Added System of Assessment (PVAAS) projections in reading for students in the eleventh grade. The following chapter is a discussion of relevant issues including value-added assessment, academic growth, educational growth models, school improvement models, and the Tennessee Value-Added Assessment System.

Documentation

Scholarly books, educational journal articles, and research documents were reviewed through the Penn State University library. Additional databases searched included ERIC, EBSCOhost, InfoTrac One File, Journals@Ovid, ProQuest, and ProQuest Digital Dissertations. The online databases of Google also provided information for the search of the pertinent literature. Bibliographic and reference listings were accessed from appropriate titles discovered within the review process. Approximately 125 current scholarly articles pertaining to value-added assessment, academic growth, educational growth models, school improvement models, correlates/characteristics of effective schools, Tennessee Value-Added Assessment System, Pennsylvania Value-Added Assessment System were reviewed.

Value-Added Assessment

Increased testing of students to measure accountability has resulted in greater availability of longitudinal student achievement data and heightened interest in modeling of both student
growth and educational inputs to that growth (Lockwood, 2007). Growth Models provide educational accountability and measure progress by tracking the achievement scores of the same students from one year to the next with the intent of determining whether or not, on average, the students make progress. Growth models can either monitor cohorts as they pass through a grade or individual students as they move along grades.

Status models are often contrasted with growth models. A status model (such as Adequate Yearly Progress [AYP] under NCLB) is a snapshot of a subgroup or school’s level of student proficiency at one point in time (or an average of two or more points in time) and often compares that proficiency level with an established target. In AYP, that target is the annual measurable objective (AMO—the level of proficiency the state established as an annual goal for schools and students). Progress is defined by the percentage of students achieving at the proficient level for that particular year, and the school is evaluated based on whether the student group met or did not meet the goal (Goldschmidt, et al., 2005, p. 3). A status model has less data requirements than do growth models, but does not allow for clear differentiation between environmental factors and student factors. Following individual student scores is preferable over status models because growth models can incorporate each student's starting point that reflects their own unique history (Raudenbush & Bryk, 2002) and makes it possible to separate systematic school-wide effects from individual student differences (Choi, Goldschmidt, & Yamashiro, 2005).

Although several current growth models can be found in the literature, the Value-Added Analysis (VAM), or otherwise referred to Value-Added Assessment (VAA) or Value-Added Analysis (VAA), has gained the most notoriety and is the most utilized growth model in the education world. Lambert and Lines (2000) and Strand (1998) used the term "value-added" to describe the achievement level or knowledge that the school added to a student's progress over or
below what might reasonably be expected by given factors. Policymakers are particularly intrigued by VAM because of the view that its complex statistical techniques can provide estimates of the effects of teachers and schools that are not distorted by the powerful effects of such non-educational factors as family background (McCaffrey, Lockwood, Koretz, & Hamilton, 2003). VAM uses a complicated statistical system to compute data and follows the academic achievements of individual students over several years. According to its proponents, it is not skewed by such factors as race, income, or English proficiency. It is a method of measuring student academic progress over time by using annual standardized test scores for individual children to report their progress. When the method is used, many researchers, policymakers, and educators are confident it provides strong evidence that teachers are the most important element in student achievement no matter what the students’ racial, class, or economic background (Stewart, 2006)

State Education Departments and school districts are lobbying the federal government to use value-added analysis rather than AYP to measure student achievement and, consequently, rate schools. Hershberg et al., (2004) contended VAA enjoys several advantages over Adequate Yearly Progress (AYP) measures:

1. It traces individual students over time, while AYP uses cohort comparisons. Cohorts do not allow one to see if schools are having an impact on the same students over time.

2. Because it measures growth, value-added can distinguish schools that are making no progress from those that may have missed their absolute targets but are clearly making some progress.

3. Value-added maintains a focus on all children. Thus, students performing above proficiency and those far below it are less likely to be ignored in the assessment process.
Value-added analysis provides two important assumptions. First, it assumes that one can measure an individual's growth in learning from one measured occasion to the next; therefore, it tracks the progress of individual students over time. Second, VAA also assumes that schools have only partly contributed to changes in test scores. School evaluations need statistical methods to separate the impact of the school from the impact of non-school characteristics, such as students' socioeconomic background. For this reason, value-added analysis relies on advanced statistical methods to estimate the effects of schools (Doran, 2003a). As Thum and Bryk (1997) argued, "Anything other than a value-added based approach is simply not defensible" (p. 102). The promise of VAA rests in its focus on individual growth trajectories and its perceived ability to adequately isolate the influence of a school from other factors believed to influence a student's learning (Doran, 2003b).

Among the most prominent examples of value-added assessment in education is the Tennessee Value-Added Assessment System (TVAAS), developed by William Sanders and associates at the University of Tennessee (Sanders, Saxton, & Horn, 1997). TVAAS is the most widely-known application of VAA in the U.S., and efforts to extend or replicate this model are currently under way in school districts in Dallas, Texas (Webster, Mendro, Orsak, & Weerasinghe, 1998), and in other states, including North Carolina, Ohio, and Pennsylvania. In addition, value-added assessment has been used in various countries of the United Kingdom for nearly 20 years. TVAAS developers have made the bold claim that, by using prior student achievement as a covariate, the model adequately accounts for all the potent external influences on student learning, thereby allowing the proper isolation of teachers' direct effects on learning (Bracey, 2004). TVAAS uses statistical mixed-model methodology to enable a multivariate, longitudinal analysis of student achievement, and to aggregate those data to the classroom and
school levels. TVAAS scores have been demonstrated to yield estimates of student and teacher
effects that are statistically independent of socioeconomic confounding and do not require direct
measures of these variables (Ross et al., 2001).

According to Sanders (2003), Test data requirements for a robust value-added assessment
system include the following:

1. The data must come from tests that are highly correlated with curricular objectives.
2. The scales from these tests must have sufficient stretch to measure the progress of both
very low and very high achieving students.
3. The test must have appropriate reliabilities. This is usually not a problem for tests with
40+ items per test.

Further, statistical criteria for a robust value-added assessment system are:

1. The system must have the capability of providing a multivariate, longitudinal analysis
using all test data for each student - no matter how sparse or complete.
2. The system must have the capability of producing best linear unbiased predictors
(BLUP, or other appropriate shrinkage estimates) of the effects of schools and classrooms on the
rate of academic progress of student populations.
3. The system needs to have the capacity to use test data from a diversity of sources
without requiring an equating of previously administered tests.

As noted above, developers claim that using student prior achievement as a covariate (or
blocking factor, as explained above) the model accounts for all the potent external influences on
student learning, allowing the isolation of teacher effects on learning (Sanders, 2000). Even
though this study is not dealing with the topic of teacher effect on student achievement, it is
important to discuss this in the review of the literature because it is one of the fundamental
principles of value-added analysis.

The Value-Added Assessment (VAA) model measures the effectiveness of teachers by the academic growth they provide to students in an academic year. The research, based upon millions of student achievement records, has clearly indicated that differences in teacher effectiveness is the single most important school factor affecting academic growth of populations of students (Haycock, 1998; Jordan, Mendro, & Weerasinghe, 1997; Sanders & Rivers, 1996). Supporting this statement, Tucker and Strong (2001) asserted, “The single most critical factor in determining student academic progress is the teacher” (p. 34). Consequently, VAA reports provide educators with data that directly measures the “value” or “growth” that a teacher, school, or school system has on a student in one academic year. Although measuring teacher effectiveness on student achievement alone is a controversial topic, and understandably so, if these data are not used to measure the quality of instruction students receive a valuable opportunity to improve teaching in schools is negated.

Sanders (1998) using TVAAS data has done numerous studies and research on the quality of teachers and their impact on student achievement. Sanders alleged that, “Of all the contextual variables that have been studied to date (indicators of school socioeconomic status, class size, student variability within classrooms, etc.), the single largest factor affecting academic growth of populations of students is differences in effectiveness of individual classroom teachers” (p. 27). A 2003 RAND Corporation Study (McCaffrey et al., 2003) concluded:

The recent literature on VAM (Value-Added Model) purports to show that teachers differentially affect student learning and growth in achievement. This literature suggests that teacher effects are large, accounting for a significant portion of the variability in growth, and that they persist for at least 3 to 4 years. A relatively small number of papers
are the source for these claims. We conclude that although the papers have shortcomings, together they provide evidence that teachers have discernible, differential effects on student achievement, and those effects appear to persist into the future. (p. xii)

To describe the impact of instruction on student learning, VAA calculates three-year running averages for the value-added gains made by all students in individual classrooms. Hershberg et al. (2004) concluded these instructional results fall into three categories: (a) Highly Effective – Students are stretched so that their performance significantly exceeds their records of past achievement; (b) Effective – Students achieve a year’s worth of growth from where they began the year; and (c) Ineffective – Student performance consistently and significantly falls below the level of achievement student demonstrated in past years.

An important point to make is, “that while value-added measurement can help to identify strong or weak teachers, it cannot by itself create more good teachers” (Zurawsky, 2004, p. 4). Value-added assessment by itself does not improve student achievement. However, Hershberg et al., (2004) asserted “if educators analyze the valuable data it provides and use what they learn to guide instruction and professional development, and if administrators create an environment that encourages these activities, more students will be able to achieve at higher levels” (p. 29).

In their study on teacher effectiveness, (Wright, Horn, & Sanders, 1997) concluded, It is clear from the research that the two most important factors affecting student gain are the teacher and the achievement level for the student. The teacher effect is highly significant in every analysis and has a larger effect size than any other factor in twenty of the 30 analyses. The achievement-level effect is significant in twenty-six of the thirty analyses and has the largest effect size in ten of the thirty analyses. (p. 61)
Sanders discovered that children who were placed with three high-performing teachers in a row starting in the third grade scored, on average, at the 96th percentile on Tennessee’s statewide assessment at the end of fifth grade. When children with comparable achievement histories were placed with three low-performing teachers in a row, again starting in third grade, their average score on the same mathematics assessment was at the 44th percentile (Tucker & Stronge, 2001). Sanders also determined that, as the level of teacher effectiveness increased, students of lower achievement were the first to benefit, and only teachers of the highest effectiveness generally were effective with all students (Tekwe et al., 2004). From the standpoint of instructional improvement, the most useful information to come out of value-added assessment is a TVAAS report that shows gains by student groups (Bratton, 1998). Educators now, through value-added measurement, have the ability to chart the growth of low performing student groups, average performing student groups, and high performing student groups.

Gain patterns across achievement groups differ widely from school to school. “The most common pattern is one that shows gains decreasing as achievement level increases… low achievers gain the most, average achievers the next most and high achievers the least” (Bratton, 1998, p. 31). This pattern is commonly referred to as the Shed Pattern. The two other group achievement patterns are the Reverse Shed Pattern and the Tepee Pattern. The reverse shed pattern, as the name indicates, contradicts the shed pattern. In this case, the previous high achievers demonstrate the largest gains while the low achievers continue to show low gains. The tepee pattern represents the average students showing the most gain, while their high and low achieving counterparts demonstrate minimal gains. A discussion of the implementation of PVAAS in Pennsylvania, the subject of the study, follows.
PVAAS

In 2002, the Pennsylvania State Board of Education passed a resolution stating the implementation of a value-added approach across the Commonwealth. In response to the resolution, the Pennsylvania Department of Education collaborated with SAS in North Carolina to provide the statistical analysis of the data. Dr. William Sanders is the senior manager of value-added assessment and research for SAS and, consequently, his TVAAS model was employed in Pennsylvania. The Pennsylvania State Board of Education approved the first value-added pilots in the commonwealth in 2003, and in 2006 all Pennsylvania districts and schools received value-added results for the first time (Pennsylvania Department of Education, 2006).

Using the annual student scores on the Pennsylvania State System Assessment (PSSA) reading and mathematic assessments, The Pennsylvania Value-Added Assessment System (PVAAS) provides school districts with a detailed summary of the progress of its students and schools for available grades between 4 through 8, and 11. The PSSA is the state’s accountability metric and is of much importance to educators and policymakers in the state. The PSSA is the only test administered to students from all school districts in Pennsylvania. The PSSA reading test measures students’ reading comprehension through a series of questions linked to brief reading passages. The questions ask student to recall specific information from the passages and to make inferences on the basis of that information. All PSSA tests are matrix sampled and consist of multiple-choice and constructed response items. The reliability of the individual student PSSA scores is very high, ranging from .91 to .94 across year, grade levels, and subjects (McCaffrey, 2007, p. 25).

PVASS is an analysis of extant test-scores data to produce summary statistics on the performance of schools and students. The information supports decision-making about
eductional programs and practices for the district, school, or individual student. SAS contains summary statistics for districts through a series of reports available on the Internet. Districts are free to use the PVAAS information as they deem appropriate, including deciding whether to make the data accessible to personnel at the school level (McCaffrey, 2007). The PVAAS reports contain five broad categories of information: Value-Added Report or Value-Added Summary Report, Diagnostic Report, Performance Diagnostic Report, Student Report, and Student Projection Report. Table 1 shows a typical PVAAS report.

Table 1

*Typical PVAAS Report*

<table>
<thead>
<tr>
<th>Subject</th>
<th>Grade</th>
<th>Year</th>
<th>N</th>
<th>Mean Student Score</th>
<th>Mean Score %ile</th>
<th>Mean Prew Score</th>
<th>Pred Score %ile</th>
<th>School Effect</th>
<th>Effect Std Err</th>
<th>School vs State Avg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading</td>
<td>11</td>
<td>2008</td>
<td>448</td>
<td>1474.3</td>
<td>66</td>
<td>1470.1</td>
<td>65</td>
<td>4.1</td>
<td>7.3</td>
<td>NDD</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2009</td>
<td>462</td>
<td>1454.5</td>
<td>62</td>
<td>1452.7</td>
<td>62</td>
<td>1.7</td>
<td>7.2</td>
<td>NDD</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2010</td>
<td>511</td>
<td>1438.8</td>
<td>60</td>
<td>1447.3</td>
<td>61</td>
<td>-8.3</td>
<td>6.7</td>
<td>NDD</td>
</tr>
<tr>
<td></td>
<td>3-Yr-Avg</td>
<td>1421</td>
<td>1455.1</td>
<td>63</td>
<td>1456.2</td>
<td>63</td>
<td><strong>-0.8</strong></td>
<td>4.1</td>
<td>NDD</td>
<td></td>
</tr>
</tbody>
</table>

*To view additional reports, click on the underlined numbers or words.*

PVAAS reports are not used for accountability by the state, and the reports were recently made available to the general public on-line in the spring of 2011 through the PVAAS website.
Teacher level data are not included as part of the Pennsylvania Department of Education’s implementation of PVAAS. Pennsylvania has not collected teacher linkages to student achievement data; therefore, it is not possible to provide teacher-level analysis. The Commonwealth of Pennsylvania and the Pennsylvania Department of Education (PDE) currently provide two growth models for school districts. The first, a value-added model that is used for school improvement purposes allows schools to compare themselves to a growth standard and provides valuable insights regarding whether or not students as a group made one year’s worth of progress. In contrast, the second model uses a projection methodology that allows schools to determine if individual students are on a trajectory to achieve and maintain proficiency according to state standards (The Pennsylvania Department of Education Proposal to the US Department of Education for Participation in the No Child Left Behind (NCLB) Growth Model Pilot Program February 15, 2008 Submitted by Gerald L. Zahorchak, EdD).

In 2008, The Pennsylvania Department of Education (PDE) requested implementation of a projection to proficiency/growth metric to assess the effectiveness of including a longitudinal analysis of student achievement data for the determination of AYP status. One goal of the PDE’s proposal was to recognize schools in which students have not yet achieved proficiency, but have demonstrated significant growth towards proficiency in a time frame aligned to Pennsylvania’s Annual Measurable Objective (AMO) targets. Secondly, PDE wanted to inform Pennsylvania schools that they should address the growth of students who are presently rated as proficient so that these students would continue to perform in the proficient range in the future.

One of the major questions regarding the projection methodology is whether or not these projections allow for reliable and valid inferences to be drawn. PDE, in their proposal to the
U.S. Department of Education, demonstrated the relationship between the projected scores and the observed scores in the future. Table 1 displays the multiple correlation coefficients in reading between the projected scores and the subsequent observed scores in the future. The multiple correlation coefficient (R) measures the strength of the association between the independent variables and a dependent variable. The closer the R is to 1, the stronger the linear association is. The projected scores came from models that were developed on a pooled within school basis for all schools in Tennessee (PDE Growth Model Proposal).

Table 2. Relationship Between Projected Scores and Later Observed Scores

<table>
<thead>
<tr>
<th>Subject</th>
<th>Grade</th>
<th>Years in Advance</th>
<th># of Prior Scores</th>
<th>Prior Grades</th>
<th>Multiple Correlation (R)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading</td>
<td>8</td>
<td>1</td>
<td>20</td>
<td>Grades 3-7</td>
<td>0.854</td>
</tr>
<tr>
<td>Reading</td>
<td>8</td>
<td>1</td>
<td>12</td>
<td>Grades 5-7</td>
<td>0.853</td>
</tr>
<tr>
<td>Reading</td>
<td>8</td>
<td>1</td>
<td>8</td>
<td>Grades 6-7</td>
<td>0.849</td>
</tr>
<tr>
<td>Reading</td>
<td>8</td>
<td>1</td>
<td>4</td>
<td>Grades 7-7</td>
<td>0.835</td>
</tr>
<tr>
<td>Reading</td>
<td>8</td>
<td>2</td>
<td>12</td>
<td>Grades 4-6</td>
<td>0.830</td>
</tr>
<tr>
<td>Reading</td>
<td>8</td>
<td>2</td>
<td>8</td>
<td>Grades 5-6</td>
<td>0.828</td>
</tr>
<tr>
<td>Reading</td>
<td>8</td>
<td>2</td>
<td>4</td>
<td>Grades 6-6</td>
<td>0.813</td>
</tr>
<tr>
<td>Reading</td>
<td>8</td>
<td>3</td>
<td>12</td>
<td>Grades 3-5</td>
<td>0.804</td>
</tr>
<tr>
<td>Reading</td>
<td>8</td>
<td>3</td>
<td>8</td>
<td>Grades 4-5</td>
<td>0.803</td>
</tr>
<tr>
<td>Reading</td>
<td>8</td>
<td>3</td>
<td>4</td>
<td>Grades 5-5</td>
<td>0.795</td>
</tr>
</tbody>
</table>

This table clearly displays that the correlation between projected scores and observed score (for the year of the projection) exceeded 0.80 even when projecting three-years in advance.

Subgroups and Achievement

While research investigating relationships between demographic variables and academic growth is a relatively new component in educational literature, research investigating significant predictors of student achievement has a long history. However, after more than 40 years of study into how social realities and the policies and practices of school personnel impact student achievement, a clear consensus has not emerged (Teddie & Reynolds, 2000). Numerous
research findings suggest that the major factors affecting student achievement are largely outside the school's control, notably the student's background characteristics and the school's general context (Mahimuang, 2005). Early large-scale studies suggested that student background and home characteristics were primary predictors of student performance and achievement levels (Coleman et al., 1966; Jencks et al., 1972). Conclusions drawn from these studies suggested that schools and teachers might have, at best, a limited impact on student learning. However, later research dealing with variations in school environments began to identify relationships between the organizational structures and climates of schools and the levels of student performance (Brookover, Beady, & Schweitzer, 1979; Coleman, Hoffer, & Kilgore, 1982).

The perception of a relationship between low socioeconomic status (SES), sometimes classified as economically disadvantaged status, and academic achievement is well established in educational research (Bornstein & Bradley, 2003; Brooks-Gunn & Duncan, 1997; Coleman, 1988; McLoyd, 2000). Socioeconomic status can be determined in a number or ways; however, the most common criteria for identifying low socioeconomic status in a school system is the percent of students that qualify for participation in the federally funded free or reduced lunch or breakfast program. Participation in a free or reduced lunch or breakfast program provides a uniform and easily identifiable condition for inclusion in an economically disadvantaged subgroup (Zvoch & Stevens, 2006). The economically disadvantaged subgroup is listed as an official subgroup when calculating Adequate Yearly Progress (AYP) under the mandates of the No Child Left Behind (2001) legislation (U.S. Department of Education, 2010).

This perception of the existence of a relationship between economically disadvantaged status and academic achievement became prominent with the release of the Coleman Report (Coleman et al., 1966). Coleman and coauthors issued their report about inequality in schooling
in which they concluded that the strongest predictor of academic performance was not found in school-based characteristics. Rather, the report concluded that the most significant predictor of academic performance was the student’s family background as measured by household income, parental socioeconomic status, and other similar variables.

Since the release of the Coleman report, subsequent research on the effects of socioeconomic status and academic achievement has provided mixed reviews. White (1982) reviewed early research on the relationship between economically disadvantaged status and academic achievement. White’s analysis indicated that the degree of relationship between economically disadvantaged status and academic achievement varied greatly. Several studies completed on this topic since 1980 have provided conflicting results. The results of the studies have ranged from a strong relation (Lamdin, 1996; Sutton & Soderstrom, 1999) to no significant correlation (Ripple & Luthar, 2000; Seyfried, 1998).

A later meta-analysis study on research (Sirin, 2005) contained the conclusion that a medium-to-strong relationship between economically disadvantaged status and achievement exists. Further, Sirin suggested that the socioeconomic status of the family impacted the educational process both in terms of home resources available to support educational endeavors, and in terms or indirect support of the schools. Sirin’s results were consistent with some of the earlier findings. Reynolds and Walberg (1992) determined that family socioeconomic status affects the kind of school and classroom environment to which the student has access. However, they also found that the degree of relationship was moderated by the source and range of SES variables and other demographic variables such as student grade, racial status, and school location.
Although Sanders claims that his value-added model adequately accounts for all the potent external influences on student learning, his model has come under criticism for failing to do enough to control for SES and demographic factors (Kupermintz, 2002; Linn, 2001). Some members of the research and policy community are skeptical that the contributions of schools and teachers can be measured accurately without controlling for contextual variables that also influence student achievement gains (Darling-Hammond, 1997; Popham, 1997).

Earlier TVAAS studies had shown no difference in gains between schools with low percentage of students on free and reduced price lunches versus those with high percentages of students qualifying for the lunch program (Bratton, 1998). Studies show that the effects of teachers may even be larger than those of socioeconomic status and other student background factors (Sanders & Rivers, 1996; Wright et al., 1997). Family income remains the strongest predictor of scoring 1500 on the SAT - an absolute test score; however, when predicting student progress, teacher effectiveness is 10 to 20 times more powerful than income, class size, race, or family educational background (Hershberg et al., 2004).

**Race/Ethnic Division**

The persistent achievement gaps that exist among children of different race/ethnic backgrounds and SES are an issue that has commanded public research, and policy attention, on and off, for about 100 years now. The passage of NCLB has brought the issue once again to the forefront for practitioner, researcher, and policymaker agendas (Perez-Johnson, 2007). The nation’s changing demographics –by 2010, Hispanics are expected to become the largest minority group in the U.S., and by 2050, the majority of the U.S. population is projected to be non-White (U.S. Census Bureau, 2004) – have also prompted calls to close the achievement gap. The state policy of concentrating low-income minority students in particular public schools
(notably, those in central cities) and providing different resources to schools in poor and rich communities exacerbates the educational disadvantages faced by students individually and compounds neighborhood disadvantage with school disadvantage (Fisher et al., 1996; Massey & Denton, 1993; Wilson, 1987). Walters (2001) contended “We need to consider the possibility that the same social political processes that result in racial segregation in living arrangements and racial discrimination in the labor market also produce racially segregated schools and racial inequality in school resources” (p. 37). The famous 1954 U.S. Supreme Court decision in Brown v. Board of Education of Topeka, Kansas found that separate schools for white and African American children were unconstitutional because separate educational facilities were “inherently unequal.”

Standardized tests and assessments are detrimental to many students of color because they are culturally and linguistically biased (Jimenez, Garcia, & Pearson, 1995), emphasize low-level thinking skills, and often lead teachers to refocus classroom practice around test-taking at the expense of genuine learning (Foster, 1994; Lomawaima & McCarty, 2006; Lomax, West, Harmon, Viator, & Madaus, 1995; McDermott, Goldman, & Varenne, 2006; McNeil, 2000). Race still matters in the sense that structural racism is abundant and children of color continually under-perform according to standardized measures of achievement in the current educational system. Most African American, American Indian, Latino, and Pacific Islander students are underrepresented in gifted areas and overrepresented in special education (Brayboy, Castagno, & Maughan, 2007).

There is undisputed evidence that strong accountability systems have increased the achievement gap between White students and their Black and Hispanic counterparts (Borg, 2007). Hanushek and Raymond (2003a, 2003b, 2004) found that the gains made by Black and
Hispanic students on the NAEP test in the states with strong accountability systems were approximately 6 to 10 points lower than the gains made by White students between the fourth and eighth grades. Despite decades of research investigating racial test score disparities and continuing policy initiative aimed at reducing these gaps, progress has been slow and disappointing. White and Asian students continue to perform significantly better than black or Hispanic students on achievement tests (Stiefel, 2007). As Jencks and Phillips (1998) argued, reducing or eliminating these gaps in performance “would probably do more to promote [the goal of racial equality] than any other strategy that commands broad political support” (p. 4). Although there have certainly been structural changes to schools throughout the past 100 years, inequality has remained, with students of color consistently provided a lower education in a system that purports to provide equal educational opportunities (Alexander, 2001; Lewis, 2003, 2004; Vigil, 1999).

Other studies disagree with the conclusions reached by Hanushek and Raymond (2003a, 2003b, 2004) and Carnoy and Loeb (2002). In their national study using data collected from 28 states engaged in high-stakes testing of one sort or another, Amrein and Berliner (2002b) concluded that “there is scant evidence to support the proposition that high-stakes tests—including high-stake high school graduation exams—increase student achievement” (p. 1). Further, the study also concluded that, “the implementation of high school graduation exams results in a decrease in academic achievement” (2002b, p. 1). Certainly, effective schools are those that can accommodate a range of student SES and abilities. The following section is a discussion of factors that are associated with effective schools.
Effective Schools

Many researchers throughout the years have studied the characteristics of effective schools and the factors that enhance or hinder student achievement. The Coleman report, which was referenced earlier, was commissioned by the U.S. Department of Education in 1964 and was the first major study to examine the factors related to student achievement. As a direct outcome of the Civil Rights movement, President Johnson ordered the commissioner of Education to conduct a nationwide survey regarding the availability of Educational opportunity in the U.S.

The Coleman Study resulted in five major conclusions: (a) Family background is important for achievement, (b) the relationship of family background to achievement does not diminish over years of schooling, (c) variations in school facilities, curriculum, and staff have little effect on achievement independent of family background, (d) school factors that have the greatest influence (independent of family background) are the teacher’s characteristics, not the facilities and curriculum, (e) attitudes, such as sense of control of the environment or a belief in the responsiveness of the environment, were found to be highly related to achievement.
(Mayeske, 1973)

The Coleman Study was the compilation of a comprehensive research study that consisted of achievement and aptitude test results for more than 640,000 students in grades 1, 3, 6, 9, and 12. Additionally, 60,000 teachers in 4,000 schools completed questionnaires regarding their background and training. The resulting report (Coleman, Campbell, Hobson, McPartland, Mood, Weinfield, & York, 1966) *Equity in Educational Opportunity* was published in July 1966. The Coleman Report findings are well summarized in the following sentence:

Taking all of the results together, one implication falls above all: that schools bring little to bear on a child’s achievement that is independent of his background and general social
context; and that this very lack of an independent effect means that the inequalities imposed on children by their home, neighborhood, and peer environment are carried along to be the inequalities with which they confront life at the end of school. (p. 325)

The findings of the Coleman report were supported by Christopher Jencks and his colleagues who published *Inequality: A Reassessment of the Effects of Family and Schooling in America*, which was based on a reanalysis of Coleman’s data (Jencks et al., 1972). Among the findings articulated in the Jencks study were the following: (a) Schools do little to lessen the gap between rich students and poor students, (b) schools do little to lessen the gap between more and less able students, (c) student achievement is primarily a function of one factor – the background of the student and (d) little evidence exists that education reform can improve a school’s influence on student achievement.

Although the preliminary works of Coleman and Jencks painted a rather bleak picture with their assertion that the “school effect” had very little impact on student achievement, other researchers were not so convinced and decided to continue to investigate the characteristics that contributed to effective schools. Ronald Edmonds was an early pioneer in the Effective Schools movement. In an article published in the October 1979 issue of Educational Leaders, Edmonds introduced the original six correlates or characteristics of Effective Schools. These correlates were later pared down to the following five school level factors associated with the school effective movement of the 1970s:

1. Strong administrative leadership.
2. An emphasis on basic skills acquisition.
3. High expectations for student achievement.
4. A safe and orderly atmosphere conducive to learning.
5. Frequent monitoring of student progress.

Another list of school-level factors that has been widely used in the educational spectrum is the one developed by Levine and Lezotte (1990). In their review of the research literature they relied heavily on case studies using what might be thought of as an “outlier design” focusing on the characteristics of the top 25% schools as opposed to the bottom 25%. Their analysis produced the following findings regarding the characteristics of effective schools:

1. Productive climate and culture.
2. Focus on central learning skills.
3. Appropriate monitoring.
4. Practice-oriented staff development.
5. Strong leadership.
7. High expectations and requirements.

Since that time, the conceptual framework of the correlates has been investigated, and the National Alliance for Effective Schools (NAES) has identified seven newer, more broadly based correlates specified below:

1. Clearly stated and focused school mission.
2. Safe and orderly climate for learning.
3. High expectations for students, teachers, and administrators.
4. Opportunity to learn and student time-on-task.
5. Instructional leadership by all administrators and staff members.
6. Frequent monitoring of student progress.
7. Positive home/school relations.
Marzano (2003) reviewed much of the research on school effectiveness and school-level factors that impact achievement and determined that school-level factors identified by most of the previously mentioned researchers generally fell into five basic categories. Marzano even went a step farther and ranked these school level factors by order of effect or impact on student achievement. The five factors listed in rank order by Marzano as listed below:

1. Guaranteed and Viable Curriculum.
3. Parental and Community Involvement.
4. Safe and Orderly Environment.
5. Collegiality and Professionalism.

Smoker (2011) stated three simple things are “essential” for schools: reasonably coherent curriculum (what we teach), sound lesson (how we teach), and far more purposeful reading and writing in every discipline, or *authentic literacy* (integral to both what and how we teach). Smoker contended that numerous studies demonstrate that these three essential elements are only rarely implemented. Schmoker (2006) argued every credible study confirms that they are still pushed aside by various initiatives, every year, in the majority of schools.

The touchstone for effective schools is the impact on students’ educational outcomes (Mortimore, 1998). School effectiveness emphasizes the importance of evaluation, feedback, and reinforcement. Evaluation is seen as a key mechanism of effective schooling. According to school effectiveness researchers, the value-added approach to comparison is preferable (Sun, Creemers, & DeJong, 2007). School effectiveness can be modified by school improvement factors, which are discussed in the following section.
School Improvement

Since the inception of public education in the U.S., researchers and educators have been examining methods of improving schools and determining variables that have both a positive and negative effects on student achievement. While teachers have been grading and assessing students to measure their performance since the development of formal education, until the authorization of the No Child Left Behind Legislation in 2002, there was no standard accountability system in place for all public schools in the U.S.

The NCLB required every state department of education in the country to develop a standardized assessment plan for measuring student academic performance in mathematics and reading. States responded by adopting academic standards and developing statewide assessments to measure student achievement. With the increased accountability that was placed on schools to ensure that all students were achieving Adequate Yearly Progress (AYP) and meeting the standards, an emphasis was placed on improving schools and increasing educational opportunities for students.

School improvement is seen as a specific branch of the study of educational change. Although many people may think of school effectiveness and school improvement as one in the same, they are two different movements with distinct and separate characteristics. School improvement researchers argue that a picture of the current effectiveness of schools does reveal how school can become successful. Creemers and Reezigt (1997) observed that there are intrinsic differences between the school effectiveness tradition, which ultimately is a program for research with its focus on theory and explanation, and the school improvement tradition, which is a program for innovation focusing on change and problem-solving in educational practice. Unlike the effective schools movement, which is more of a menu list or accumulation of best
practices commonly found in successful schools, the school improvement process takes a more holistic view of the entire school and, based on the characteristics of the school, is an effort to develop a plan for improvement that is unique for that school. Schools have to design and invent their own solutions for specific problems and improvements. It is in this respect that school improvement is important because it focuses on the journey to success and the necessary conditions to support successful change (MacBeath & Mortimore, 2001; Stoll & Wikeley, 1998).

Despite the differences, Creemers and Reezigt (1997) and others (e.g., Reynolds, Hopkins, & Stoll, 1993) advocated further linkage between school effectiveness and school improvement for mutual benefit. School effectiveness research and theory can provide insights and knowledge that can be implemented in school improvement. School improvement is a powerful tool for the testing of theories. School improvement can also provide new insights and new possibilities for effective school factors, which can be analyzed further in effective school research. In recent years, there have been examples of productive cooperation between school effectiveness and school improvement, in which new ways of merging the two traditions/orientations have been attempted (see Gray et al., 1999; MacBeath & Mortimore, 2001; Reynolds & Stoll, 1996; Stoll & Fink, 1992, 1994, 1996; Stoll, Reynolds, Creemers, & Hopkins, 1996).

In 1996, the National Association of Secondary School Principals (NASSP) released a book entitled, Breaking Ranks: Changing an American Institution. As a roadmap for reform, the original Breaking Ranks publication listed over 80 recommendations for high school administrators and teachers to consider for improving student achievement in their schools. In 2004, NASSP published a second Breaking Ranks book entitled, Breaking Ranks II: Strategies for Leading High School Reform. Building from the principles and recommendations in the
original *Breaking Ranks* publication, *Breaking Ranks II* was developed as a field guide for the principal and school leadership team wishing to shoulder the responsibility for school reform by implementing the recommendations established in *Breaking Ranks*.

*Breaking Ranks II* pared down the original 80 recommendations from *Breaking Ranks* into 31 recommendations that have been clustered or assigned to one of three core areas: (a) Collaborative Leadership and Professional Learning Communities; (b) Personalization; and (c) Curriculum, Instruction, and Assessment. Also included in *Breaking Ranks II* are Cornerstone Strategies to Improve Student Performance which include establishing the essential learning for students and adjusting the curriculum and teaching strategies to realize that goal; increasing the quality of interactions between students, teachers and other school personnel; implementing a comprehensive advisory program to assess student academic and social progress; Ensuring teachers use a variety of instructional strategies and assessments to accommodate individual learning styles; flexible scheduling that enhances teaching strategies and allows for effective teaming and lesson planning; instituting structural leadership changes that promote effective communication with students, teachers, family, and community members; and, aligning ongoing professional development programs with the content knowledge and instructional strategies required to prepare students for graduation.

Blankenstein (2004) in his popular book *Failure Is Not an Option* identified six principles that his research concluded guided student achievement in High Performing schools: (a) Common mission, vision, values, and goals; (b) Ensuring achievement for all students: systems for prevention and intervention; (c) Collaborate teaming focused on teaching and learning; (d) Using data to guide decision-making and continuous improvement; (e) Gaining active engagement from family and community; and (f) Building sustainable leadership capacity.
Reeves (2006) in *The Learning Leader* described the trends and characteristics for the schools with the greatest gains in achievement and equity for students. Reeves contended schools that serve as exemplars embrace holistic accountability, include consistent nonfiction writing assessments in every subject, use frequent common assessments, provide immediate and decisive intervention, and constructively use data.

The No Child Left Behind legislation requires state educational agencies to allocate funds directly to local agencies for schools identified for school improvement, corrective action, and restructuring. The law requires state departments of education allocating the funds to give priority to local educational agencies that: (a) serve the lowest-achieving schools; (b) demonstrate the greatest need for such funds; and (c) demonstrate the strongest commitment to ensuring that such funds are used to enable the lowest-achieving schools to meet the progress goals in school improvement plans.

Pennsylvania has developed its own comprehensive program to assist schools that are not making AYP. The school improvement plans require school personnel to examine and evaluate data, determine academic strengths and needs, and develop action plans and interventions designed to help improve student achievement. The state has developed a standardized document called “Getting Results” that guides educators through each step in the development of a school-wide improvement plan. Once the school’s improvement plan (Getting Results document) is complete it is reviewed by the local intermediate unit and approved by the local School Board before being sent to PDE for final approval from the state.
Conclusions

This chapter examined the research that supports the value-added model for measuring student academic growth and also presented research questioning the effectiveness of the value-added approach. The research that were gathered and reviewed by the Pennsylvania Department of Education and were used for their value-added model proposal to the United States Department of Education confirmed the positive correlation or relationship between the PVAAS projected score and the actual PSSA scores for students. A review of the literature revealed an unbalanced and incomplete record of empirical research concerning the results of data from the PSSA on programs and characteristics of schools that produce test scores that exceed PVAAS growth projections in the state of Pennsylvania.

Furthermore, this chapter explored student demographic variables and their impact on student achievement. It is important to keep in mind that this study examined student growth in reading, which is different from student achievement in reading. For AYP purposes, students are placed in subgroups and their state testing results are reported by these various subgroups, with socioeconomic status and race being the two most frequently discussed and researched factors. In regard to student achievement, the research clearly points to a connection between student socioeconomic status and race and how students perform academically. This study was a measure of whether or not these and other demographic factors have an effect or relationship to student growth in reading, which is an area that appears to be lacking in research.

Additionally, this chapter was an examination of the research related to the correlates or characteristics of effective schools and as well as a review of research pertaining to school improvement. The effective schools research cites the importance of schools having a solid curriculum, a positive learning environment, high expectations, and appropriate monitoring of
student progress (assessment). Similar to the effective schools research but more grounded in
practice rather than theory, school improvement tenets such as sharing a common mission,
emphasis on student achievement, collaboration, data-driven decision making, securing
family/community involvement, and building leadership capacity have all been proven
approaches to increase student achievement. Both the Effective schools and school improvement
research emphasize the importance of accountability and the need for more clearly defined
regulatory structures. This “rationalistic” perspective contradicts some of the earlier more
“naturalistic” educational views expressed by researchers (Lee, Holland, and Bryk, 1993).

The purpose of the study was to identify the programs and characteristics that are present
in high schools whose student test scores exceed the Pennsylvania Value-Added System of
Assessment (PVAAS) projections in reading for students in the eleventh grade. As stated earlier,
there is a wealth of information and research in regard to student factors and school
characteristics that effect student achievement. However, this study is an effort to determine if
these same student factors or demographics shown to influence achievement also effect growth.
Similarly, the question was addressed about whether the effective school’s correlates and/or
school improvement practices associated with high achieving schools are also found in high
growth reading high schools in Pennsylvania.

Summary

Chapter 3 contains a summary of the methodology used to identify schools that represent
the greatest gains in student academic growth using the PVAAS projected scores and the actual
performance on the reading PSSA. In addition, the process for obtaining information from the
principals of these high performing schools is summarized, as well as how the data was
analyzed.
CHAPTER 3: METHODS

The purpose of the qualitative study was to identify the practices or combination of practices that are present in high schools whose eleventh grade students have exceeded the Pennsylvania Value-Added System of Assessment (PVAAS) projections for reading progress. Additionally, a quantitative analysis of the following variables was implemented to determine if there was a relationship between these variables and PVAAS reading growth scores: Percentage of Special Education Population, Percentage of Low Income Students, Graduation Rates, Wealth of the School or District, and Race (White, African American, Hispanic, and Other). Using three years of PVAAS “Average Growth Index” scores provided by the Pennsylvania Department of Education, the researcher identified high schools in Pennsylvania that exceeded the projected PVAAS growth scores as determined by the PSSA reading results. Following the determination of representative schools, principals were surveyed to explore school environment factors that may account for how their students rose above expectations in reading proficiency. Data collection was focused on the programs and school characteristics present in high schools that exceed the expected growth in reading proficiency for eleventh grade students over three years. A regression analysis was run on the variables described above to determine if there was a relationship between any of these independent variables and the dependent variable (the PVAAS three-year growth index score). The intent of the study was to determine common characteristics or instructional programs that are inherent in outlier schools. The desired outcome was a list of best practices inherent in these high performing schools that could be replicated by other schools to better increase their students growth in reading while in high school.

The methods and procedures of this study addressed three components.

1. Accessing data from the Pennsylvania Department of Education with which to
compare the PVAAS predicted mean scores versus the actual PSSA reading mean scores for all high schools in the state of Pennsylvania for the purpose of identifying outlier schools.

2. A qualitative component with which to explore the demographic characteristics and instructional programs and practices of purposeful selected schools that exceed PVASS growth projections for eleventh grade reading PSSA through surveys and interviews with the principals of those schools.

3. A regression analysis of the following school factors to determine if there is a relationship between any of these variables and the reading growth as measured by the mean three-year growth index score.

Sampling Frame

The state of Pennsylvania is located in the northeastern and mid-Atlantic region of the US. The ethnic population is comprised of 79.5% Caucasian, 10.8% Black or African American, 5.7% Hispanic or Latino, and the remainder are small percentages of Native Americans, Asians. and others (U.S. Census Bureau, 2010). The total population of the state as of 2010 was 12,440,621 million. As of 2005, 86.7% or Pennsylvania residents had a high school diploma, and 25.7% has a Bachelor’s degree or higher. Pennsylvania schools rank 12th among the states in reading proficiency (U.S. Department of Education, 2010).

Samples of potential participants represented the target population of interest, with the sampling frame comprised of the population from which the sample is drawn (Neuman, 2003). The sampling frame’s function is to inform inferences gleamed from research data. The sampling frame defines the represented population as well as excluded population groups. Schools in the study were selected from the PVAAS state-wide database showing outlier schools exceeding projections based on three-years’ worth of data. PVAAS data was released to the
public in the spring of 2011 and contains the PVAAS school projections and results for all 501 school districts and their respective schools based on the 2010 PSSA reading results. However, for the purpose of this study the researcher was able to obtain permission from the Pennsylvania Department of Education to have access to three-years of school projected mean scores versus actual mean scores, the difference of mean scores otherwise referred to as “growth” or “School Effect” scores, for all Pennsylvania High Schools for the 2009, 2010, and 2011 testing years.

Suzuki, Ahluwalia, Kwong-Arora, and Mattis (2007) asserted that the decision regarding the number of participants in qualitative studies becomes a reflection the study’s purpose. Creswell, Hanson, Clark, and Morales, (2007) suggested that 10 to 12 participants may prove sufficient in qualitative studies involving the understanding of experiences and perceptions of participants. Also, a successful sample in a qualitative study could range from 1 to 40 (Creswell, 2012), or from 5 to 25 participants (Polkinghorne, 1989). Gordon (1992) and Clayton (1997) addressed the issue of the appropriate number of participants in qualitative research with a range of 15 to 25 participants expected to provide thematic saturation. Thus, for the purpose of this study the researcher has elected to identify the top high schools in terms of growth from the state of Pennsylvania. In order to ensure that an appropriate number of schools are represented in the sample, 125 schools were selected for the study. As mentioned previously, the researcher has been provided with three-years of growth data for every high school in the Commonwealth. In order to identify the top performing schools in terms of growth, a three-year “Growth Index” mean score was calculated using the data obtained from the Pennsylvania Department of Education. After these mean scores are calculated, the top 125 schools, approximately 20% of the Pennsylvania Public High Schools were chosen to participate in the study by surveying the principals of these schools. Following the collection of the surveys, principals from six
randomly selected schools in the top decile of reading growth, based on their three-year growth index scores were selected for an on-site interview. The schools selected for the on-site visitations and interviews were within a 100-mile range of the researcher’s home in Central Pennsylvania. The purpose of the interviews was to ensure a robust and authentic data collection process that can only be obtained by immersion in the school environment through a site visitation.

It is also worth noting several criteria and parameters that were established at the onset of this study. In order to ensure that there were an appropriate number of students enrolled in a school to provide valid PSSA and “School Effect” data, only high schools with one hundred or more students enrolled in grade eleven during the 2010-2011 school year were selected for the study. Additionally, charter and cyber schools, which do not have the same certification requirements nor state or federal regulations as public high schools, were excluded from this study. Lastly, only schools that had “Growth Index” scores for all three-years (2009, 2010, and 2011) were included in the study.

**Data Collection Procedure**

The study was conducted in the following manner. Permission to use human subjects was obtained from the Pennsylvania State University Institutional Review Board pursuant to the U.S. Federal Government Department of Health and Human Services (2009) regulation 45 CFR § 46.10, which states the probability and magnitude of harm or discomfort anticipated in the research should not be greater in and of themselves than any ordinarily encountered in daily life, or during the performance of routine physical or psychological examinations or tests. A letter and consent form asking potential participants to engage in the study was sent to the principals in the top decile of reading growth schools (Appendix A). Those not responding within 2 weeks
were sent a follow up letter and consent form (Appendix A). Appointments were made with each principal at a time and place convenient to them. The procedure and conditions of the study were reviewed prior to administration of the instruments, a demographic survey (Appendix B) and an Interview Protocol (Appendix C).

Face-to-face interviews enhance the researcher’s ability to cover complex issues (Jobber, 1991; Singleton & Straits in Gubrium & Holstein 2002). Singleton and Straits determined that face-to-face surveys (a) allow a maximum degree of probing, (b) yield a higher and more valid response rate than interviews conducted through virtual mediums, (c) provide flexibility, and (d) facilitate clarification of questions and terminology. Face-to-face interviews are useful when a significant amount of information is required. Questions can develop internal to the interview and can become complex. Weick (1995) provided support for storytelling with the following comment.

If accuracy is nice but not necessary in sensemaking, then what is necessary? The answer is, something that preserves plausibility and coherence, something that is reasonable and memorable that embodies past experience and expectations, something that resonates with other people, something that can be constructed retrospectively but also can be used prospectively, something that captures both feeling and thought, something that allows for embellishment to fit current oddities, something that is fun to construct. In short, what is necessary in sensemaking is a good story. (p. 60)

The process of qualitative research is exploratory; thus, the researcher’s role is investigative (Creswell, 2012). Merriam (1998) contended the interviewer must be one with a tolerance for ambiguity, possess an investigative nature, have sensitivity to personal prejudices,
be a good communicator, and have some knowledge of the subject matter under study. As a practicing principal in a Pennsylvania high school, the researcher has extensive experience of the demands and expectations placed on school leaders, teachers, and students on a daily basis. With this in mind, the goal is to gather information from the school principal on the programs and characteristics of the school without being obtrusive to the operation or functioning of the school system.

The function of a pilot study is to determine if the Interview Protocol allowed for variances in the responses. Validity of the open-ended questions was determined by implementing a pilot study with two individuals who met the participation criterion for the study. Questions were evaluated and the two participants were asked to provide feedback before the main study was conducted. A researcher-constructed set of questions is required to be pilot tested for accuracy and correctness (Creswell, 2012).

**Internal and External Validity**

The criteria of validity measures how effective the design is in employing measurement methods that capture the data being sought to address the purpose of the study (Salkind, 2003). There are two types of validity: internal, and external. Internal validity is the measure of certainty that study results were produced by the research process, and not by other factors. Neuman (2007) viewed internal validity as a confirmation of the correctness of the study design. A goal of a good interview protocol is to be both reliable and valid (Creswell, 2012). The questions in the Interview Protocol in Appendix C were, in part, based on the primary research question in Chapter 1. A question about legal and ethical considerations was included in the questions. Internal validity was further assured with pilot testing of the Interview Protocol to assure the instrument is clear and unambiguous. Pilot testing of instruments is a procedure to
enable the researcher to make modifications to an instrument based on feedback from a small set of individuals (Creswell, 2012).

External validity is the extent to which the results of the study can reflect similar outcomes in other populations, and can be generalized to other populations (Salkind, 2003). The sample population fit the target population with regard to distribution among the School Effect schools in Pennsylvania. The study was conducted in a natural setting, which can be applied easily to other settings (Salkind, 2003). Given these reasons, the study design was appropriate and demonstrates validity.

**Analysis of Data**

**Quantitative Data Analysis**

The quantitative component of this study began with an analysis of the reading PVAAS “School Effect” scores for the past three-years (2009, 2010, and 2011) for all Pennsylvania High Schools. For each school in the state, the Pennsylvania Department of Education (PDE) provides a growth score, which is referred to as “School Effect.” The School Effect for high schools is a measure of growth for grades 9 to 11 and provides an estimate of the school’s impact on students’ academic progress. Specifically, the School Effect is a function of the difference between the observed/actual PSSA achievement and the predicted PSSA achievement. If students score as expected (i.e., students’ observed/actual scores are equal to their predicted scores), then the estimated School Effect would be 0. A negative School Effect indicates students’ actual scores were lower than their predicted scores, while a positive School Effect indicates students’ actual scores were higher than their predicted scores (https://pvaas.sas.com).

Additionally, a regression statistical analysis was run using demographic data on each school to look for relationships between the dependent variable (PVAAS Growth Index Mean)
and the following factors (independent variables), which are frequently reviewed and examined when exploring effect on student achievement: (a) percentage of economically disadvantaged students (as determined by the number of students enrolled in the free or reduced lunch program); (b) race (percentage of White, African American, Hispanic and Other student populations); (c) percentage of students with Individualized Education Plans (IEPs), (d) the wealth of the school; (e) and the school’s graduation rate. By applying a regression model statistical analysis for each of these factors, the researcher identified whether there was a correlation or relationship between any of these variables and student growth in reading based on the PVAAS growth data.

**Qualitative Data Analysis**

Qualitative and quantitative data analyses are the “two analytical tools abstracted into summary statistics, but allowed to speak for themselves as manifestations of different aspects of the problem” (Park, 1996 p. 14). Interviews were expected to last approximately 1 hour, after which results were transcribed into text (Maxwell, 2005). Interview audio-recordings were transferred to two CDs and transcribed with an Internet based transcription service or ExpresScribe audio transcriber. ExpresScribe is an audio software program allowing the transcriber to control the speed of the audio recording. Transcriptions were returned to the participants who were asked to assure the accuracy of the transcription.

Erickson (2005) noted “audio recording allows the researcher the opportunity to revisit events vicariously through playback at later times” (p. 72). Notes pertaining to observations were taken during interview process. Bogden and Bilken (1992) contended reflective notes “provide an opportunity for the researcher to record personal thoughts, speculation, feelings,
problems, ideas, hunches impressions and prejudices” (p. 12) as well as to stimulate analytic insights. Similarly, Erikson (1986) suggested:

Write-up stimulates recall and enables the researcher to add information to that contained in the unelaborated, raw notes. Write-up stimulates analytic induction and reflection on relevant theories and bodies of research literature. There is no substitute for the reflection during fieldwork that comes from time spent with the original field notes, writing them up in a more complete form, with analytic insights recorded in them. (p. 72)

Common themes were sorted and categorized pertinent to the development of best programs and practices for schools needing support for reading improvement. Combining tape recordings, transcription, and the use of reflective notes provides validity, assists in omitting potential biases, provides anecdotal stories, and allows for “repeated observations” (Maxwell, 2005, p. 145).

The data analysis method was theme discovery, which is used to respond to the questions: “who says what, to whom, why, how, and with what effect” (Babbie, 2003, p. 309). Patton (2002) contended that data collection should be followed by inductive reasoning. Inductive reasoning is a process for developing conclusions and generalizations. Farber (2006) suggested qualitative data should be organized into categories and interpreted to enable construction of a holistic picture by coding into themes, patterns, concepts, jokes, or similar features.

The design of the Interview Protocol (Appendix E) ensured that participants were not rushed in their responses to allow depth and breadth of the required information during the interview.


**Ethical Considerations**

Leedy and Ormrod (2005) cited concerns relative to obtaining informed consent, guaranteeing rights to privacy protecting research participants from harm, and adherence to professional codes of ethics. Care was taken to ensure participants understand the nature of the study and that their participation was voluntary. No sanctions or incentives were used to promote participation, nor were any be applied if the participants declined or withdrew from the study. No information regarding individual or collective participation was communicated to any organization.

To protect the identity of the participants, a numerical identifier was assigned to the participants. No identifiable information was used in any publications or presentation based on the study. The study will be used only for purposes of a dissertation. Participants were informed of their right to withdraw at any time without penalty. These conditions were communicated to all participants at the start of the research. All materials relevant to data collection and analysis will be retained in a locked cabinet for three-years after publication of the dissertation, after which they will be destroyed.

**Summary**

The present study was a summary of the sampling frame and the data collection procedures. Also included is consideration of the internal and external validity and reliability. The procedure for the analysis of data is summarized, and ethical considerations are detailed. The following chapter is a summary of the results of the study.
CHAPTER 4: RESULTS

The purpose of this study was to investigate the programs and characteristics of high schools in the state of Pennsylvania that exceed the Pennsylvania Value-Added Assessment System (PVAAS) growth projections on the eleventh grade Pennsylvania System of School Assessment (PSSA). For this study, information was gathered by surveying 65 high school principals from the top quintile of high schools in reading growth based on the PVAAS projections and actual PSSA for 2009, 2010, and 2011.

Survey Data

One hundred twenty-five high school principals were contacted and asked to participate in the study by completing an electronic survey. The survey consisted of 23 questions and contained both multiple choice and open-ended response questions. The researcher was pleasantly surprised with the response rate of 52% (65 of 125 principals responded). Initially only the principals in the top decile (60 principals) of reading growth schools, as averaged by three-years of PVAAS growth index data, were invited to participate in the study. However, survey distribution was expanded to the principals of the top quintile schools for reading growth scores when the researcher did not receive the desired N=50 responses from the first tier of principals.

The survey began with more general questions designed to provide demographic information about the school and principal and then progressed into more specific questions regarding school initiatives and literacy programs utilized in the school that may account for the high growth rate in reading. The survey was created and administered to principals through SurveyMonkey® and they accessed the survey via the Internet through the link to the survey provided by the researcher. All responses were anonymous, as the researcher did not request
distinguishable information (i.e., principal name, school name, etc.) from the respondents. The anonymity and confidentiality of the survey administration encouraged principals to respond freely and accurately without fear of responses being attributed to them. During both administrations of the survey, the researcher provided specific details regarding the purpose of the study and research guidelines that were going to be employed and followed. Additionally, two follow-up requests were made to all principals invited to participate in the study requesting their assistance in the research and reminding them to complete the survey.

The principals who completed the survey varied in their years of experience in administration and the number of years they have been in their current position. The range of years that the respondents served in the capacity of working as a principal for school districts varied between less than 1 and 32 years. The average number of years that the respondents served as principals was 9.87. Similarly, the range of years that the principals served in their current schools ranged between .25 and 20. The average number of years that these principals have held their current position was 4.82.

The number of principals, including assistant principals, in these high schools that significantly exceeded PVAAS projections in reading ranged between 1 and 7. The average number of administrators in these high schools is 3.18. Most of the respondents (86%) to the survey were male. As would be expected with Pennsylvania certification requirements, all of the principals who responded to this survey had a Master’s degree or above with 12.5% of the respondents having obtained a doctorate degree.

The respondents were asked to classify their schools into one of three categories: Rural, Urban, or Suburban. Of the principals, 22.2% identified their schools as being rural. Of the principals, 6.3% were employed in an urban school setting. The majority of the principals
(71.4%) responded that they were employed in suburban school systems. Sixty-three of the 65 principals who responded to the survey provided information regarding the number of students in their respective schools. Only 3 of the 63 schools (approximately 5%) had fewer than 500 students. This figure was not surprising because schools that had less than 100 students in their junior classes were excluded from the study, and several schools in the initial top quintile fell into this category. Twenty-four high schools (38%) ranged between 501 and 1,000 students enrolled. The next highest, 23 principals, or (36%), reported an enrollment of between 1,001 and 1,500 pupils. Seven respondents (11%) worked in schools with 1,501 through 2,000 students enrolled. And, finally, the last six principals who answered this question (10%) had more than 2,001 pupils in their respective schools.

The number of credits required for students to graduate in the reporting schools ranged from 21 through 31. Similarly, bell schedules in these respective schools varied as well. High school bell schedules are often a point of contention when discussing school reform. Most of the research is inconclusive on whether or not a traditional schedule or block schedule is best for meeting the learning needs of students. The majority of the principals who responded to this study (61%) said that their school operated on a traditional schedule. Fifteen respondents (23%) reported that their school was on a block schedule. Of the schools surveyed, 11% had a hybrid schedule where classes were offered in both a traditional and block format depending on the class in which the student enrolled.

As previously mentioned in the literature review, assessment data used to calculate AYP for schools were reported and analyzed for identified subgroups. For this study, principals in the high growth reading high schools were asked to share the percentage of students in significant subgroups used to determine AYP. The special education subgroup, which consists of students
with an identified learning disability, who are provided with an Individualized Educational Plan (IEP), has been an obstacle for many schools to meet the AYP standards developed by the federal government in the No Child Left Behind (NCLB) legislation. The percentage of IEP students in the surveyed school ranged from a low of 5%, which was reported by three principals, to a high of forty percent of the population being IEP students. The mean was fourteen percent and the mode was 15% of the student population identified for special education. The percentage of English Language Learners (ELL) in each surveyed school had a much smaller range than the IEP subgroup, ranging between zero and 15%. Forty-five principals who responded to the survey indicated that their schools had an ELL population of one percent or less.

Socioeconomic status by many accounts is considered the variable that has the biggest impact on student achievement. There was a wide range between the school with the lowest percentage of low-income students and the school with the highest percentage of low-income students. There were two principals that reported a poverty rate of 4%, which was on the low end of the scale. Conversely, the two schools with the highest poverty rates reported that 65% of their students were eligible for free or reduced lunch based on family income.

Of the 6 principals who answered the questions pertaining to their school’s AYP status, 34 (54%) reported that their schools made AYP during the 2010-2011 school year. Twelve (19%) of the respondents indicated that their schools were in warning for not making AYP in that school year. Eight of the schools were identified as being in School Improvement Status for missing the AYP threshold in at least 2 years and, lastly, nine principals conveyed that their respective schools fell into the Corrective Action category, which is reserved for schools that did not reach the AYP target four or more years. Of the schools that did not make AYP in reading,
three principals stated that their “All Students” score did not meet the AYP standard. Nine principals reported that their IEP subgroup failed to meet the required performance target. Furthermore, fourteen respondents indicated that their economically disadvantaged subgroup prevented their schools from making AYP. Only one principal indicated that their ELL student population did not meet the AYP threshold. And, lastly, seven schools reported that a racial/ethnic subgroup in their building did not meet the AYP performance goal. Of the 29 schools that did not make AYP and were designated in warning, school improvement, or corrective action status, 10 schools did not make AYP due to failing to meet the performance target in only one category. Four schools missed the AYP threshold in two categories, and the remaining five schools failed to meet the AYP standard in three or more subgroups.

The principals who were surveyed were asked if their school required students to demonstrate proficiency in the reading standards to graduate. Only 29 responded to this question. Eighteen (62%) of respondents confirmed that students must demonstrate proficiency in reading to graduate. Additionally, principals were asked if they had a mentoring program in their schools to assist students throughout their high school experience. Sixty-two of them answered the question, with the majority (65%) replying that their school does not have a formal mentor program in place to assist students.

The schools that participated in the study were evenly split on whether or not they offered a test preparation program to prepare students for taking the PSSA. Thirty-one principals indicated that their schools did not have a test preparation program in place for their students. Conversely, 32 confirmed having a test preparation program in effect to help their students perform better on the PSSA. The majority, 14 of the 32 schools that offered test preparation programs, provided this service to students via a test preparation course that student were
scheduled into for credit. Closely behind the test preparation course option, twelve principals reported that their schools met the test preparation need by offering remediation programs. Four respondents indicated that preparation for the PSSA was embedded in the curriculum of specified core courses. One principal stated that his/her school specifically targeted students in the economically disadvantaged subgroup and provided these students with PSSA related tutoring twice per/week beginning approximately ten weeks before the PSSA was administered.

Through personal experiences and observations as a high school principal, most of the schools offer some sort of tutoring or remediation program for students who are not meeting the reading and/or math standards as evidenced by not scoring at the proficient level on the PSSA or some other benchmark assessment administered by the school. In the schools that exceeded the PVAAS projections in reading, it was important to determine what type of tutoring/remediation programs these schools offered and when did these services occur. Not surprising, of the 63 principals who responded to this question only six said that they do not have a tutoring or remediation program available for students in reading. Many principals offered multiple responses to this question (i.e., they offered both tutoring and a reading course for credit to assist their below proficient students). Most respondents, 35 principals, replied that their respective schools offered a remedial reading class for credit for students who were below proficient. Twenty-seven principals said that lower performing readers received tutoring or remediation during the school day to help improve their skills. Surprisingly, with shrinking school budgets in Pennsylvania, 18 respondents reported that their schools provided reading tutoring for students either before or after school hours. Thirteen principals indicated that their schools offered some sort of “other” tutoring/remediation program for their students. As one would expect, their
remediation programs varied quite a bit. One school required students to double up in reading taking two periods of reading per/day.

Benchmark assessments have become another popular strategy for assessing student achievement and then charting growth throughout a course. The purpose of a benchmark assessment is to identify student strengths and needs in regard to the academic standards and then target instruction so that students attain the required knowledge and skills. Twenty-three principals reported that their school used a district developed benchmark assessment, which was administered to students several times throughout the school year. Twenty-seven high schools utilized the popular 4-Sight Assessment to measure their students’ achievement of the reading standards. Nineteen respondents indicated that students in their schools were administered the Classroom Diagnostic Tool (CDT) developed by the Data Recognition Center (DRC), which is the company that Pennsylvania contracts with for the development and administration of the PSSAs and the newly developed Keystone Exams for high school students. The CDT, which is an on-line assessment for students, provides immediate results to the teachers and gives them a detailed report of students’ strengths and needs in regard to the reading standards. Three principals confirmed that their schools use the Group Reading Assessment and Diagnostic Evaluation (GRADE) to measure student performance in reading. Twenty-four of the principals in these high growth high school reported that their schools used some sort of “Other” benchmark assessment to measure reading achievement. Study Island and MAP (from MWEA) were the most frequently reported benchmark assessments being used by these schools.

Educators are constantly looking for programs that will help their struggling readers improve their reading skills. The schools that participated in this survey varied in the types of reading programs that they utilized to develop reading and literacy skills for their struggling
students. The Read 180 program was the most popular among the principals who completed the survey. Eighteen of them reported using this program to increase the reading skills of their below proficient students. Reading Apprenticeship, the second most popular program among the respondents, was reported to be the reading program of choice in 12 of the schools. Surprisingly, 15 principals responded that they had no formal reading program in place to develop reading/literacy skills for their struggling readers. Both the Fast Forward and Reading Plus programs were utilized by two of the schools in the survey. Most of the respondents (28) shared that their schools used a reading program that was not one of their possible selections. Four of these schools reported using the Wilson Reading program to assist their students in reading and three schools indicated that they use SRA Corrective Reading to assist their struggling readers. Other reading program and strategies that were reported include: Read Naturally, Language Program, Sustained Silent Reading, teacher developed resources, use of the reading specialist, reading classes, etc.

In the past, many high schools focused their reading efforts and resources on students who were reading below grade level and needed additional support to improve their reading skills. While this approach was helpful for lower readers, it did little to improve the reading skills of students who were reading at or above grade level. To address this issue, many schools developed programs designed to promote reading skills and strategies across all classes in the school, commonly referred to as “reading across the curriculum” or “reading in the content areas.” For this study, principals were asked if their school had a school-wide reading across the curriculum in place to enhance the literacy skills of all students. Surprisingly, 38 of the 63 respondents who answered this question replied that their school did not have a school-wide reading program or curriculum in place. Conversely, 25 principals cited that their schools do
have such a reading program in place to assist all students in the reading process. The Reading Apprenticeship Model was the most frequently utilized school-wide reading program with eight principals reporting its use in their schools. Respectively, six principals indicated that their schools provided training to teachers for implementing reading strategies in the content areas and five reported that their school has a Silent Sustained Reading (SSR) program that is implemented throughout the school. Lastly, schools reported doing the following in order to promote reading across the curriculum: KTO grant, DEAR program in English, partnerships with local universities, co-teaching support in English and social studies classes, summer reading program, cross curricular assignments, monthly literacy focus for all curricular areas, etc.

Homogenous versus heterogeneously grouping students in high school classes remains a point of controversy and dissention among educational researchers and practitioners in the field. Although the research seems to overwhelmingly support the benefits of de-tracking students and educating them in a heterogeneous classroom setting, high schools have been reluctant to change their practices and continue to track students by placing them in homogenous classes based on student ability/achievement levels. As expected, the majority of the principals in high growth reading schools who responded to the survey reported that their schools homogenously group students in the humanities core subject areas (English and social studies). In fact, 36 of the 63 respondents who answered this question, reported to tracking students based on ability.

Conversely, 23 of the high school principals surveyed responded that students were heterogeneously grouped in their schools’ English and social studies classes. Four principals replied that their school offered some other form of grouping students in their humanities classes. Of the principals who selected “other,” three reported grouping students homogenously for
English, but heterogeneously for social studies and one principal stated that his school was heterogeneously grouped for English but homogenously grouped for social studies.

As one might expect, the last and probably most important question, “please explain why you believe your school grows students in reading at a rate significantly higher than the predicted PVAAS score,” contained the most varied responses from the 55 high school principals who answered this open answer question of the survey. To assist in analyzing the responses to this question, the researcher coded the answers that the principals provided into one of the following six most reported categories: School Culture (parent, student, and staff expectations), Data Driven Decisions, Elementary and/or Middle School Programs, Interventions and Tutoring, Content Literacy Instruction, and Rigorous and Aligned Curriculum. While most of the responses from the principals fell into one of the six aforementioned categories, six principals noted that their schools were implementing multiple approaches to ensure that student reading performance increased in high school. One principal reported that his school benefitted from two periods of English Language Arts instruction in seventh and eighth grade, has a quality curricula designed in-house and based on PA eligible content standards, and has devoted and highly professional English Language Arts teachers. Another principal noted seven reasons for his school’s success: (1) On grade level instruction for IEP students; (2) STAR reading assessment for all students; (3) Reading classes for deficient readers; (4) Reading strategies used by all teachers; (5) Reading and writing “at-the-bell” activities in all classes; (6) Double up English/Reading classes for applied level students; and (7) Co-taught English/reading classes for special education students. A third principal reported that all of his teachers are told to reinforce the importance of reading and writing in all classes, children read in school and become stronger because of that, and our language arts department focuses on eligible content and the children are
prepared for the PSSA reading section. Interestingly, another principal cited a focus on skills over content, data to drive tiered interventions, and a whole school focus on literacy. The fifth principal reported an increased focus on staff development initiatives, proper curriculum mapping design through identification of core maps, and initiatives like Professional Learning Communities and Networks that allow them to strategize on multiple levels to help students grow in reading and writing. The last principal who reported invoking multiple strategies to help his students grow beyond PVAAS predictions mentioned targeted interventions, a dedicated reading coach/specialist, school-wide investment in reading, district commitment of resources to improve reading performance, and effective staff development as the key components to his school’s success.

Not surprising, of the 52 principals who offered a reason for their schools exceeding PVAAS projections in reading, the largest number (15 respondents) stated that their school’s emphasis on content literacy strategies coupled with direct instruction in reading was the main reason for their schools notable growth in reading. A common theme among the principals in this group was the emphasis on professional development with the staff so they had the appropriate training on best practice reading instruction to incorporate these strategies with their students in the classroom.

The next most popular category, with 13 principals citing it as their school’s reason for exceeding PVAAS projections, was school culture. From a researcher’s perspective this response was the most difficult to explain and identify because it is more about a feeling or intuition. More so than simply school culture, this category included community, parent, and student commitment and high expectations for success. The following are example responses that fell into this category:
Both our students and parents place great value on education. We have a fairly well-behaved student body that understands our expectations for learning and performance. We have high achieving students from a high ability community. I believe part of our success is simply just a good bloodline amongst our students. I would give most of the credit to the culture of the community and school. Our students come primarily from homes with highly educated parents and there is a very high expectation for education success in our community. Most of our students are focused on academics, as they know how important it is to be a college bound student. Teachers have raised expectations for all students. There is a consistent emphasis on continual academic success. And, we are fortunate to live in a rather affluent community where literacy is valued.

Seven principals attributed the success of their school’s reading growth to the targeted interventions and instructional support and tutoring programs provided for students. Interventions such as after school tutoring programs, instructional support teams (IST), co-taught classes for struggling learners, the implementation of professional learning communities, and the use of common assessments to diagnose “learning gaps” for students.

Five principals referenced their strong curriculum coupled with sound instructional strategies that are aligned to the curriculum as the primary reason for their school’s growth in reading. Rounding out the remaining categories, respectively three principals cited that their schools focus on data and making data-driven decisions is the reason for their positive reading results and the same number of principals (three) credited the strong reading programs in K-6 and middle school for their schools strong PVAAS results in reading.
Principal Interviews

The data gleaned from the principal surveys were very helpful in obtaining general information and providing an overview of the factors and characteristics found in schools that exceed PVAAS projections in reading. However, to further explore and obtain a more detailed, rich picture of the characteristics and programs that are prevalent in these high growth schools the researcher visited several of the schools and conducted personal interviews with the respective principals. The procedures that were followed and the questions that were used in the interviews are found in Appendix C.

The principals who were selected to be interviewed were randomly chosen from the top 40 high schools in terms of reading growth using the three-year mean growth scores that were calculated from the 2009, 2010, and 2011 cumulative growth indexes in reading. Schools that exceeded a 100-mile radius from the researcher’s home in Lancaster, Pennsylvania were excluded as possible interview sites due to travel distances. Six principals agreed to be interviewed and provide information about their schools for this study. The schools whose principals were interviewed ranged from the top school in the state to the 29th ranked school using the mean growth score calculations. Three schools were located in the Central Pennsylvania region while the other three schools were Suburban Philadelphia high schools. Five of the six high school principals interviewed classified their schools as suburban, while the sixth principal listed her school as rural. Three male and three female principals were interviewed and their years of experience as an administrator ranged from 9 to 18 years. To maintain confidentiality, each principal was assigned a letter of the alphabet, A-F, and was referred to by that letter throughout the interview. The demographic information for each principal and his/her school is included in Appendix D.
One constant that was shared among the principals who were interviewed was a focus on providing reading supports to students in need immediately upon their entrance into high school. All of the principals interviewed had either a reading class or a remediation/tutoring program to assist 9th grade students who were not meeting the reading standards based on the 8th Grade PSSA or benchmark exams administered to students at the start of 9th grade. Two of the principals indicated that they formerly had reading specialists but lost those positions due to budgetary cuts. Both schools are now supporting students in reading through their English classes. The other four schools have reading specialists who provide support for their struggling readers. The schools with reading specialists utilize them in a variety of ways. Three of the schools push their reading specialists into regular education classes either as a co-teacher or reading facilitator to support students directly in their classrooms. One of the schools exclusively utilizes pullout remediation – scheduling students with a reading specialist for support during their study halls. Two of the four schools with reading specialists also offer a strategic reading classes for credit that below proficient readers enroll in at the high school. Interestingly, two principals mentioned that their schools utilize the Wilson Reading program in working with students in their special education population who are reading significantly below grade level.

All of the principals interviewed for this study indicated that their schools utilized benchmark assessments to determine their students’ proficiency of the reading standards and chart their growth in reading. Two of the schools employed the 4-Sight assessment as their reading benchmark tool with one school administering this exam three times per school year and the other running it four times per/year. Two of the schools have district developed benchmark assessments that were created by their reading specialists and English/Language Arts teachers.
Principal B reported that their English, reading, or special education teachers give her students the district-developed benchmarks twice per year; while Principal C stated that only students who are assigned to work with the reading specialists in his school are administered the benchmark assessments to monitor their reading skills and progress. Principal D indicated that his school has utilized the 4-Sight and Classroom Diagnostic Tool in the past, but didn’t think that these two assessments were too effective. Therefore, they are currently headed toward district-developed benchmark assessments “but aren’t there yet.” In the meantime, they are using the mid-term and final exams as the benchmarking exams in their school.

Principal D’s school appeared to have the most comprehensive benchmark assessment program for students. All ninth and tenth grade students in this school take the MAP (Measure of Academic Progress) assessment at the beginning and then the end of the school year. Teachers are provided with the MAP results the day after the test is administered to determine individual student’s strengths and weaknesses in regard to reading. The school district initiative is to have all students achieve a year’s growth in a school year and the pre and post MAP helps to measure that growth. In addition, all ninth and tenth grade students in this school participate in the Teen Biz literacy program in their English classes. Teen Biz is an Achieve 3000 on-line literacy program that purports to be the only such program that is differentiated for students in high school.

Data-driven decision making has certainly become a popular word in education and all of the principals interviewed for this study indicated that their schools were analyzing student data to help their students master the academic standards. All of the schools had a process for ensuring that their teachers had access to student PSSA, benchmark, or common assessments data. Electronic databases and student information systems have made the process of
downloading and accessing student testing results a rather simple process for teachers and administrators. Principals, supervisors, curriculum specialists, counselors, and other professionals have access to student achievement data at both the individual and disaggregated level with the push of a button on the computer. While all students who take the PSSA receive their results from the state at the beginning of the subsequent school year, the researcher was interested in knowing if any of these high growth schools in reading shared benchmark-testing data (other than required PSSA results) with their students. Half of the six principals interviewed reported that teachers in their schools share the benchmark assessment results with students. Principal E stated that not only are the benchmark results shared with students but they are shared with their parents as well. In another school, students were provided with their testing data to assist them in developing their own learning goals for the school year.

All of the schools of the principals I interviewed had a staff development program in place designed to help teachers better meet the learning needs of their students. Two of the schools were Learning Focused Schools and therefore prescribed to the tenets of that program and structured their staff development around the Learning focused principles. Principal A reported that her school completed a “huge literacy movement” before she arrived and they currently have a staff development program now in which teachers choose training from a menu of options based on their professional development needs. Her school recently completed a 2 year staff development initiative on differentiated instruction and this year began a new 2 year focus on professional learning communities. Principals in all of these schools attempted to maximize their staff development time by focusing on established school and/or district initiatives. Most interesting to the researcher was the finding that four of these high schools have moved away from the traditional information sharing faculty meetings and are now providing
professional development during this scheduled time with staff. Principal D noted how the
format of faculty meetings has changed greatly from when he first started. “In the past, faculty
meetings were mostly informational and most times were canceled. Now we establish a
professional development plan to be conducted at faculty meetings for the entire year in
coordination with the other high school in our district.” Principal F stated that professional
development has always been a component of faculty meetings and informational items are
delivered by email and a weekly electronic newsletter that is sent to staff and parents.

Surprisingly, only two of the six principals interviewed were able to reference a specific
school-wide literacy initiative or program implemented in their schools. Principal F reported that
all of his teachers were trained in Project CRISS (Creating Independence through Student-
Owned Strategies), which is a professional development program designed to help all students
read, write, and learn more effectively. While principal E responded that all of her English
teachers were using strategies from the Penn Literacy Program with student in their classes.
Other principals cited programs such as Wilson Reading and Reading Workshop, which are used
for struggling readers, but are not school-wide literacy initiatives. Several of the principals also
alluded that their staffs have been exposed to reading across the curriculum training at some time
in the past. All of the principals confirmed that their school districts are offering literacy
programs for their students in the elementary and middle school levels; however, they were not
able to provide any names or details of these programs.

As one might expect from schools that are performing very well in literacy, there was no
indication from the principals that they had difficulty holding staff accountable for student
learning. Four of the six principals interviewed mentioned that they and their administrative
teams are frequently in classrooms doing walkthroughs and this administrative visibility helps to
hold teachers accountable. One principal also explained that he reviews the walkthrough data with the staff at each month’s faculty meeting to ensure that building goals/initiatives are being met in the classroom. There was a sense from all of the principals interviewed that the teachers in their schools have high expectations for themselves and students and have developed their own systems of accountability for professionalism and student learning. Some of the responses shared with the researcher were: “The staff is extremely professional.” “Teachers are constantly sharing their work and what they are doing in class with their colleagues and no one wants to look like an idiot in front of their colleagues.” “It’s part of the culture and everyone just does it.”

Four of the six principals interviewed for this study indicated that they played a role in the literacy vision and plan for the building. Two of these principals viewed their role as to provide guidance and support for the department chairs and other building leaders who are responsible for delivering the literacy program to the teachers. Only two of the principals stated that they were directly involved with the planning, developing, and delivering of the literacy initiatives to their staffs. Principal E said, “I am responsible for the entire thing.” “I’m required to do a school improvement plan and provide programs for students not meeting the standards.” “I’m the one who takes the lead on professional development and models the strategies that teachers should be using.” Principal E assumed the overall responsibility for her school’s literacy program but went on to say that it is a team effort with assistance from her assistant principals, department heads, and teacher leaders in the building. The two principals who reported having little or no involvement with the literacy programs in their buildings said that the district office provides the goals, initiatives, and training related to literacy in their respective schools.
Mirroring the last question of the on-line questionnaire sent to principals throughout the state, the researcher was interested in determining why the principals who were interviewed felt that their schools exceeded the PVAAS growth projections in reading by such a high rate? Not surprisingly, all six principals referenced that their communities and schools have high academic expectations for students. Only principal E mentioned that there was a cultural change during her tenure that led to higher expectations from students, staff, and parents. The other principals indicated that the high expectations have been prevalent in their schools and communities for a long time. Some of their comments were as follows: “I believe that one thing that helps us achieve such growth is that there are very high parental expectations in the district.” “Clientele—we have educated parents and that plays a large part in it.” “Our Kids come from a deep gene pool. Parents expect our students to thrive and our students want to thrive. Last year 99% of our students went on to a 4-year college. It’s pretty much engrained in our culture.” “Backgrounds where the students are coming from—highly educated parents. There’s a strong belief that you are going to college and high, high expectations.” “Parents expect us to push their kids. This community has very high expectations of teachers and educators in this district.”

Principals also cited other reasons as well for their schools high growth in reading. Principal A emphasized how her school is intentional at looking at student data when they come into the high school and students that are lacking in reading skills are enrolled in a program designed to improve their reading scores by at least two grade levels in one year. Ninth and 10th grade students who are below grade level in reading are scheduled into a strategic literacy class and are assigned to classes with a reading specialist as a co-teacher. Principal B noted how the superintendent has raised the bar for all students, moving Algebra 1 to sixth grade and allowing ninth grade students to enroll in Advanced Placement World History. Principal D said that the
teaching staff his school hires is pretty elite and there is a cross-curricular responsibility for student achievement in his building. Similarly, principal E discussed the fact that the reading initiative in her school was done throughout the curriculum and specifically mentioned that math and physical education teachers are having students read in their classes. And, lastly, principal E explained how his school has done an academic press – eliminated an entire level of classes so all students now have moved up a level. He also stated how they have made a conscientious effort to mainstream special education students into regular education classes that are aligned with the standards and provide a special education co-teacher to support these students in class. This school also opened up their Advanced Placement courses for more students; thereby, increasing the academic rigor for a greater number of students. Interestingly, with the increased number of students enrolled in Advanced Placement courses, the pass rates on the AP exams remained the same for the school.

Quantitative Analysis

The quantitative component of this study consisted of using the SPSS statistical software to run a multiple regression analysis to determine if there was a relationship between the criterion variable (three-year mean growth scores for Pennsylvania high schools) and the eight identified predictor variables. The predictor variables were (a) Percentage of Special Education Students, (b) Percentage of Low-Income Students (c) Graduation Rates, (d) Wealth of Schools using the MV/PI Aid Ratio, and (e) Percentage of Students Based on Race. White, African American, Hispanic, and Other were the racial breakdowns analyzed for their effect on growth. Whenever possible, the researcher tried to obtain demographic information that was specific to the school; however, in cases where this information was not available by school, the researcher
utilized the school district demographics, which should mirror that of the high school.

Demographic data was obtained from the Pennsylvania Department of Education, the Data Center at Kids Count.org, and the National Center for Education Statistics, which is a department in the U.S. Department of Education. Most of the data obtained were from the 2010-2011 or 2011-2012 school years, with the exception being the percentage of special education students, which was obtained for the 2009-2010 school year.

The basis of a multiple regression is to assess whether one dependent (or criterion) variable can be predicted from a set of independent (or predictor) variables. Linear regression analysis is based on four critical assumptions: linearity and independence of the variables, normalcy of the data, and homoscedasticity (Osborne and Walters, 2002). If any of the assumptions are violated then the results of the regression model may be inefficient or misleading. For this study the variables were entered into the regression formula using the enter method, which is the standard form for entering regression variables. The enter method is an appropriate analysis when dealing with a small set of predictors and when the researcher does not know which variables will create the best prediction equation. Using the enter method all of the variables are introduced into the regression analysis in one step.

An important step in a multiple regression analysis is to ensure that the assumption of no multi-collinearity has been met. Multi-collinearity is a statistical phenomenon in which two or more predictor variables in a multiple regression model are highly correlated. As displayed in Table 3 Pearson Correlations were calculated among seven predicted variables. As none of the correlations reached the .80 threshold, the analysis shows that no two variables are closely related.
Table 3, Coefficients and Multi-collinearity, Tolerance and Variance Inflation Factor (VIF)

**Coefficients**

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<th>Model</th>
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<th>Standardized Coefficients</th>
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<tr>
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<td>1.792</td>
<td>.002</td>
<td>.036</td>
<td>.971</td>
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Table 3 also displays two other checks for multi-collinearity of the predictive variables: The tolerance levels and the Variance Inflation Factor (VIF). The tolerance levels are not below .1 and the VIF scores are well beneath 10, the relative threshold levels that indicate trouble with the data. It is important to note however that only seven predictor variables were used for this regression analysis, instead of the eight the researcher attempted to measure for this study. The race variable “White” was excluded from the regression due to its extremely high VIF value of 20958.410. The seven independent variables in Table 3 show that there is no reason for concern that the predictive variables excessively influence one another.
As previously mentioned, the researcher elected to utilize the enter method of multiple regression for analyzing the data. Using this method two predictive variables were shown to be significant at the .05 level (“Other” Race .001 and Graduation Rates .006). Table 4 shows the model summary of the predictive variables in the multiple regression analysis. Fifteen and three tenths percent of the variance is explained in the predictors of the variables? (R square .153 x 100 = 15.3; 84.7 + 15.3 = 100%). The predictive variables of Special Education, Low-Income, Graduation Rates, School Wealth, and Race (African American, Hispanic, and Other) are displayed in this model. The R Square in a multiple regression provides explanatory power by representing the explained variance that can be contributed to all the predictors in a progression. In Table 4 the Model Summary shows the R Squared of .153 (.153 x 100 = 15.3) or 15.3% of the variance in the criterion variable (three-year Mean Growth Score) was accounted for by the predictive variables in the model (F = 10.038; df = 7, 390; p = .000 or p < .05).

The purpose of the quantitative component of this study was to determine the relationship between each of the predictive variables and the dependent variable. The multiple regression analysis was conducted to test the unique contribution between the predictive variables and the
dependent variable by assigning coefficients to each predictive variable. As displayed in Table 5, the beta weight and statistical significance were analyzed and examined. Based on the results of the beta weights only two of the eight predictive variables showed significance. They are: “Other” Race $B = 14.154 (p = .001)$ and Graduation Rates $B = 6.704 (p = .006)$

Table 5:

*Summary of multiple regression analysis for variables predicting three-year mean growth ($n = 398$)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>$B$</th>
<th>$SE B$</th>
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<td>.065</td>
<td>1.792</td>
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</table>

Notes: $R^2 = .153$ ($*p < .05$)

The researcher also wanted to inspect the data to determine if the critical assumption of homoscedasticity was met in this multiple regression analysis. Homoscedasticity is reviewed to determine if the variance of error is the same across all levels of the independent variables.
Conversely, when the variance of errors differs at different values of the independent variables, heteroscedasticity is indicated. The assumption of homoscedasticity versus heteroscedasticity is checked by conducting a visual examination of a plot of the standardized residuals (the errors) by the regression standardized predicted values. Figure 1 contains a scatterplot with the standardized residual and predicted values. The plotted residuals in Figure 1 were randomly scattered around 0 (the horizontal line) indicating a normal distribution; therefore, the assumption of homoscedasticity was achieved in the regression model.

Figure 1:
Lastly, to expand the scope of this study the researcher decided to run an additional multiple regression analysis that expanded upon the predictor variables used in the aforementioned regression results. For this multiple regression, the following independent variables were measured against the three year-growth GIS to determine if there is a relationship between these variables and reading growth: Percentage of White/Asian Students, Percentage of Economically Disadvantaged Students, Number of Students in Grade 11, Number of Students in Grade 11 squared, Change in Percentage of Economically Disadvantaged from 2009 to 2011, Magnet School, Charter School, School including 8th Grade, Rural Schools, Math Index 2009, and Math Index 2010. The results of this multiple regression analysis are contained in Table 6.

Table 6, Coefficients and Multi-collinearity, Tolerance and Variance Inflation Factor (VIF)

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
<th>Collinearity Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td></td>
<td></td>
<td>2.274</td>
<td>0.794</td>
<td>2.864</td>
</tr>
<tr>
<td>White/Asian</td>
<td>-0.008</td>
<td></td>
<td>0.006</td>
<td>-0.078</td>
<td>-1.271</td>
</tr>
<tr>
<td>Econ Disadv</td>
<td>-2.790</td>
<td></td>
<td>0.675</td>
<td>-0.232</td>
<td>-4.132</td>
</tr>
<tr>
<td>Grade11Stud</td>
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<td></td>
<td>0.002</td>
<td>-0.226</td>
<td>-0.749</td>
</tr>
<tr>
<td>Grade11Stud²</td>
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<td></td>
<td>0.000</td>
<td>0.00</td>
<td>0.152</td>
</tr>
<tr>
<td>Econ Disadv09-11</td>
<td>-0.749</td>
<td></td>
<td>1.893</td>
<td>-0.012</td>
<td>-0.396</td>
</tr>
<tr>
<td>Magnet School</td>
<td>0.473</td>
<td></td>
<td>0.465</td>
<td>.035</td>
<td>1.017</td>
</tr>
<tr>
<td>Charter School</td>
<td>1.038</td>
<td></td>
<td>0.656</td>
<td>.049</td>
<td>1.582</td>
</tr>
<tr>
<td>Grade8inSchool</td>
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<td></td>
<td>0.220</td>
<td>.008</td>
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<tr>
<td>Rural School</td>
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<td>0.218</td>
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<td>-1.677</td>
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<td>MathIndex2009</td>
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<td>0.031</td>
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</tr>
<tr>
<td>MathIndex2010</td>
<td>0.197</td>
<td></td>
<td>0.026</td>
<td>.320</td>
<td>7.445</td>
</tr>
</tbody>
</table>

Notes: R² = .483 (*p < .05)
As one can see, the multiple regression model in Table 6 indicated that four predictive variables in this analysis demonstrated a significant relationship with the three-year reading GIS mean. These independent variables were Economically Disadvantaged (.000), Number of Grade 11 Students (.034), Math Index 2009 (.000), and Math Index 2010 (.000). Similar to the first regression, none of the eleven, predictor variables in this analysis had a Pearson Correlation score that reached the .80 threshold; therefore, one of the basic assumptions of no multi-collinearity were met. The variables, Number of Students in Grade 11 and Number of Students in Grade 11 Squared, had tolerance levels below the .1 threshold and Variance Inflation Factors above the threshold of 10, thereby violating the assumption of no multi-collinearity; however, being that the second variable is the square of the first, these two independent variables are supposed to be collinear because they are interpreted as one variable in the regression model.

This second regression model included important control variables that were not in the first regression such as Number of 11th Grade Students, Number of 11th Grade Students Squared, Whether the School Includes 8th Grade, Magnet Status, and Charter Status. Additionally, the sample in the second multiple regression analysis excluded schools with 50 or fewer 11th grade students. In Table 6 the Model Summary shows the R Squared of .483 (.483 x 100 = 48.3) or 48.3% of the variance in the criterion variable (three-year Mean Growth Score) was accounted for by the predictive variables in the model. The variables in the second regression model had a much higher predictive value ($R^2 = .483$) for reading growth than the first model ($R^2 = .153$).
Summary

Chapter 4 contains a summary of the findings for this research study. Information was gathered and coded looking for common themes from survey data collected from principals in high growth reading high schools and from personal interviews with several principals of these schools. In addition, eight predictor variables were investigated using a multiple regression analysis to determine their relationship to the dependent variable (three-year Mean Growth Score).
CHAPTER 5: DISCUSSION

This chapter contains a brief summary of the circumstances of the study, findings as they relate to prior research, and suggestions for possible future studies. The focus of the mixed-methods study was to identify the programs and characteristics that are present in those high schools that have exceeded the Pennsylvania Value-Added Assessment System (PVAAS) projections for reading progress for students in eleventh grade.

Summary of the Study

The purpose of this study was to investigate the programs and characteristics of high schools in the state of Pennsylvania that exceed the Pennsylvania Value-Added Assessment System (PVAAS) growth projections on the eleventh grade Pennsylvania System of School Assessment (PSSA). This mixed-methods study contained both a qualitative and quantitative analysis of the data. The qualitative component focused on the principals’ self-reported information regarding their schools’ instructional approaches, programs, and qualities, which may be attributed to the exceptional reading growth in their respective schools. Sixty-five principals in the top quintile of reading growth schools, as determined by their schools’ three-year mean Growth Index Score, responded to the survey. Additionally, six principals whose schools were in the top decile of reading growth were interviewed at their schools by the researcher to gain further insight into the programs and characteristics affecting the reading growth of their students. The interviews were recorded and transcribed to preserve the recipients responses. The researcher then reviewed and coded the data from the surveys and interviews into like responses to look for themes or patterns that emerged from the data.
The quantitative component of the study consisted of the researcher obtaining PVAAS growth data on all Pennsylvania public high schools and then running a regression statistical analysis to determine if there is a relationship between any of the following variables and a school’s PVAAS mean growth score in reading: Percentage of Special Education Students, Percentage of Low Income Students, Graduation Rates, MV/PI Aid Ratio (wealth of the school), Percentage of White Students, Percentage of African American Students, Percentage of Hispanic Students, and Percentage of “Other” Race groups. The researcher requested the PVAAS three-year cumulative Growth Index Scores in reading from the Pennsylvania Department of Education and was granted permission to obtain these scores from Intermediate Unit 13, which houses all of the PVAAS data in Pennsylvania. The information pertaining to the independent variables listed above was obtained from several reputable organizations via accessing their websites. These organizations included the Pennsylvania Department of Education, National Center for Education Statistics, and the Kids Count Data Center.

**Discussion of Results Related to Research Question 1**

*RQ1: What programs and characteristics are common among the schools that exceed predicted academic growth in reading based on the PVAAS projections compared to actual PSSA scores?*

As with any mixed-methods study, it is not possible for the researcher to determine exact cause and effect relationships regarding the characteristics or programs existing in Pennsylvania high schools and these schools exceeding their predicted reading growth scores according to PVAAS projections; however, in the this study the researcher was able to determine some common themes that emerged from the data obtained from the principals in these high performing schools.
Even though only approximately 41.5% of the high schools in Pennsylvania are classified as suburban, 58% of the top 100 reading growth schools based on a mean three-year growth index score were suburban high schools. Similarly, the majority of the principals who responded to the survey, 71.4%, reported that they worked in a suburban high school, compared to 22.2% of respondents coming from rural schools and 6.3% of the respondents reporting from urban school setting. Many high schools in Pennsylvania, 43.8%, are rural schools; yet, only 36% of the top 100 reading growth schools were classified as rural. Similarly, 14.8% of Pennsylvania high schools are identified as urban, but a much smaller percentage, only 6% of these schools, fall into the top 100 reading high schools in the state. The suburban schools had a disproportional number of schools in the top 100 in regard to reading growth in comparison to their counterparts in rural and urban schools whose numbers were significantly lower than the state-wide percentage of the total population of schools.

Providing tutoring and remediation for students not meeting the reading standards was a common practice in the majority of the high growth reading high schools surveyed for the study. Fifty-seven of the 63 principals, 90.5%, reported that their schools have a tutoring or remediation program in place to assist students reading below the proficiency level. As one might expect, an array of approaches were used in these schools utilized to provide assistance to these students in need, which included direct instruction for credit, tutoring/remediation during the school day, and tutoring/remediation after school. Most schools, 55.5%, reported that they offered a remedial class for credit to assist students who are not reading at the proficiency level. Of the principal respondents 42.8% reported that their schools provided reading tutoring/remediation during the school day for their struggling readers. Of the schools, 28.6% provided tutoring/remediation either before or after school to help their students attain reading proficiency.
Although the approaches may have varied and differed among the schools, the fact that over 90% of the top reading schools reported providing tutoring or remediation for their below proficient students indicates that this practice should be utilized by schools trying to improve their students reading performance and growth. Cohen, Kulic, and Kulic (1982), in their meta-analysis findings from 65 independent evaluations of school tutoring programs, found that these programs have positive effects on the academic performance and attitudes of those who receive tutoring.

Similar to the tutoring/remediation, virtually every principal who responded to the survey indicated that their schools were utilizing benchmark or diagnostic assessments to identify student strengths and weaknesses in regard to reading. It is important to note that most commonly used benchmark assessments have some sort of documented criterion validity; however, Brown and Coughlin (2007) noted that of the 4-Sight, STAR, MAP, and TerraNova programs, only one (TerraNova) showed strong evidence of predictive validity. Of the 62 principals who answered this survey question, only one reported that his/her school did not employ a specific device to measure student growth in reading. Conversely, 98.4% of the principals in the top reading schools based on PVAAS growth projections and actual PSSA scores, reported using benchmark or diagnostic assessments to chart growth and determine student reading deficiencies. Twenty-seven respondents stated that their schools utilized the 4-Sight Benchmark Assessment. District developed benchmark or common assessments were reported by 23 principals, followed by Data Recognition Corporation’s (DRC) Classroom Diagnostic Tool (CDT), which nineteen respondents reported using to measure student reading growth and performance. Lastly, the following other assessments were reported to be used in these top performing reading schools to chart student growth: GRADE, MAP, Acuity, Scantron Ed Performance Series, Scholastic Reading Inventory, STAR Reading Assessment, and the
PSAT. The principals’ responses to this question indicate the importance of establishing an assessment plan and program in schools to measure student performance and chart growth throughout the school year. Based on the high percentage of schools that offered tutoring and remediation programs, the benchmark and diagnostic data are an outstanding tool for identifying students in need of accessing these services.

Once students have been identified for tutoring or remediation, the primary question becomes what program(s) should be used to assist them. Unfortunately, there is no panacea in regards to a reading program that meets the needs for all students and the top growth high schools employed a variety of reading programs. Read 180 was the most popular program in the schools of the principals who completed the survey, with 29% of respondents reporting using it in their schools. Although Read 180 is a researched based program endorsed by the U.S. Department of Education’s “What Works Clearinghouse,” it is a rather expensive program that may not be a viable option for most schools considering the school funding challenges facing many school districts. Reading Apprenticeship had the second highest number of respondents, 19.4%, who reported its use in their schools. Four principals reported using Wilson reading and three stated using SRA Corrective Reading in their schools. Of the principals who responded to this question, 24.2% reported that their school does not have a reading program for struggling readers. This would lead the researcher to conclude that implementing a reading program for struggling readers in schools is a good idea; however, it is not a requirement to ensure reading growth above projected levels. Similarly, there was no indication in the survey responses that having a “reading across the curriculum” program or initiative was a key ingredient to exceeding the PVAAS reading projections. In fact, 60.3% of the principal respondents shared that their schools did not have such a program in place.
The on-site interviews with six principals whose high schools were among the top 29 in Pennsylvania for exceeding PVAAS reading growth projection confirmed much of the findings from the survey results; however, they enabled the researcher to dig deeper into the characteristics and programs of these highly effective schools. One of the most important findings from the interviews was the focus that these high performing high school have on providing reading supports to students in need immediately upon their entrance into high school. This approach contradicted what was being done in the researcher’s own school to help improve student reading results on the PSSA. As there is a three-year moratorium between the grade 8 and 11 PSSA reading assessment, the focus on remediation in the researcher’s school began during the junior year to help prepare students for the spring administration of the PSSA. As a result of this study and the findings, the remediation efforts and supports for reading will be moved to ninth grade to assist students in the researcher’s school immediately upon their transition into high school. Wheelock and Miao (2005) cited the importance of educational leaders taking the steps to support on-time progress of the most vulnerable high schools students – ninth graders – so they can progress through the educational pipeline toward graduation.

Another key finding from the principal interviews was the focused and intentional professional development program being implemented in each of these schools. According to Joyce and Showers (2002), “Staff development knowledge has reached the point where any school district can build a staff development program that enhances professionalism and supports curricular and instructional change that accelerates student learning in the personal, social, and academic domains.” The principals in all six of these schools attempted to maximize their staff development time by selecting activities related to the established school or district initiatives. Some of the initiatives and areas of focused staff development reported by the principals were as
followed: Learning Focused Schools, literacy strategies, differentiated instruction, curriculum alignment to the standards, assessment practices, and others. Although each school had different staff development goals for the 2012-2013 school year based on their perceived needs, there was a clear plan and purpose to the selected professional development. Most notable to the researcher was the number of principals who said that the primary focus of faculty meetings was for professional development, not the dissemination of information. Four of the principals who were interviewed reported that their faculty meetings are now utilized for staff development purposes and informational items are shared with staff via email or a weekly staff newsletter. This is a change from the traditional faculty meetings that focused on the dissemination of information to staff.

The last question in the interviews mirrored the last question in the survey and sought an explanation from the principals as to why they believed their schools exceeded the PVAAS growth projections by such a significant rate. A universal response among all of the principals who were interviewed was “high expectations for students.” High expectations have been noted in numerous research studies in regard to high student achievement (Bryk & Driscoll 1988; Brophy & Good 1984; Cotton 2003; Eccles & Wigfield 1985; Good 1981; Kerman 1979; Weinstein, 2002). These high expectations were shared by the community, parents, and staff and consequently were passed along to the students. Several principals referenced that the parents in their district are highly educated and therefore place great value on education and strongly encourage their sons and daughters to do well in school so they can pursue a college education. Perhaps the most surprising response to this question came from two principals whose schools were in the top five in regard to exceeding PVAAS reading projections. One of these principals cited “clientele” and the other replied “deep gene pool” as the primary reason their schools
achieve at such a high level. Although these two replies are not the most politically correct responses, they do reflect an honest assessment of why these principals believe that their schools do so well academically in regard to student growth in reading.

In summary, the data obtained through this research study provided the researcher with many insights regarding the school characteristics and programs that are common in Pennsylvania high schools that exceed their PVAAS projections. It is apparent that there is no one specific program, model, or blueprint that leads to exceptional growth in reading. However, from the information that was obtained from the principals the researcher is able to make the following assertions regarding high schools in Pennsylvania that exceed growth:

1. Schools that exceed PVAAS growth projections in reading have plans in place that include remediation and tutoring for students who are not meeting the prescribed reading academic standards.

2. Schools that exceed PVAAS growth projections in reading obtain, review, and utilize student data to maximize the learning potential for their students. These schools utilize state and benchmark testing results, as well as diagnostic testing data to determine where student strengths and needs lie.

3. Schools that exceed PVAAS growth projections in reading utilize a focused approach to staff development. Their staff development programs are not piecemealed together to meet contractual requirements. Rather, the staff development programs in these schools are geared toward solving problems that are identified in the schools’ data and then strategically planning staff development programs that are sustained and focused on improving instruction and student achievement.
4. Schools that exceed PVAAS growth projections in reading had high expectations for student achievement. The community, staff, parents, and consequently students as well shared these high academic expectations.

Each of the four aforementioned assertions made in regard to characteristics of high schools that exceed PVAAS projections in reading, can be attributed to one or more of the correlates of effective schools or school improvement recommendations that were described in the Chapter 2 literature review.

**Discussion of Results Related to Research Question 2**

*RQ2: Is there a relationship between reading PVAAS growth scores and the following school factors: percentage of special education students, percentage of low income students, graduation rates, school wealth, and race (White, African American, Hispanic and Other)?*

In the quantitative component of this study, the researcher explored the following variables – Percentage of Special Education students, Percentage of Low Income Students, Graduation Rates, MV/PI Aid Ratios (school wealth), and Race (White, African American, Hispanic, and Other) – and ran a multiple regression analysis using the enter method to determine if there was a relationship between one or more of these variables and the three-year mean Growth Index Score. Only two of these aforementioned independent variables, Graduation Rate and “Other” Race, were found to be significant thereby indicating that there is a relationship between these variables and a school’s growth in reading. A second multiple regression analysis was also run to check for a relationship between additional variables and growth. In this model that included eleven independent variables, only four predictors (Percentage of Economically
Disadvantaged, Number of Students in Grade 11, Math Index 2009, and Math Index 2010) were found to be significant.

The Other race variable for Pennsylvania high schools consisted of students who fell into one of the following racial subgroups: Asian or Pacific Islander, American Indian or Alaskan, and Multi-Racial or Multi-Ethnic. The researcher cannot provide an explanation grounded in theory to account for the relationship between the Other variable and reading growth; however, one assumption is that students in the Asian racial demographic make up the majority of students identified as Other attending Pennsylvania high schools. As mentioned in the literature review, White and Asian students significantly outperform their Black and Hispanic peers on achievement tests (Stiefel, 2007). The high academic achievement of the Asian subgroup could account for the positive correlation between the Other variable and the three-year Mean Growth Score. Additionally, it’s worth noting that the White variable for race was excluded from the SPSS software regression analysis due to its very large Variance Inflation Factor (VIF) of 20958.410. An explanation for this occurrence may be that Pennsylvania has a disproportionate number of White students (79.5%), given its large rural make up, as compared to the number of Black (10.8%) and Hispanic (5.7%) students.

The Graduation Rate variable presented a rather unique phenomenon in that graduation is something that occurs after the PSSA examinations, which are used to calculate the PVAAS Growth Index Scores (GIS). Unlike the other predictor variables in the study, which may have an effect on the criterion variable leading up to or during the administration of the PSSA, the Graduation Rate occurring after the GIS is calculated would indicate that the criterion variable has a significant relationship to the independent variable (Graduation Rate) rather than this predictor variable influencing the dependent variable. The fact that Graduation Rate was a
significant independent variable in the multiple regression analysis does make sense. One could logically assert that schools with higher Graduation Rates would be growing their students more in reading than schools with lower graduation rates.

Although the first regression analysis that examined eight variables did not have percentage of low-income students as a significant variable, the second multiple regression model with eleven variables showed this independent variable as having a relationship to the three-year mean Growth Index Score in reading. The difference in the outcome of the two models could be the result of a negative confounder or could also be a factor related to multicollinearity. Since the second regression model had a much higher R Squared score (.483) than the first (.153), the researcher decided to accept the second models analysis that percentage of low-income students is related to reading growth in Pennsylvania High Schools. This finding dispels Sanders assertion in Chapter 2 that his value-added model controls for all external variables and therefore simply relies on school and teacher factors to measure student growth. Conversely, however, it affirms the literature and research in Chapter 2 pertaining to the effect that socioeconomic status has on student achievement results.

The second regression analysis also showed that the 2009 and 2010 Math Growth Index Scores and the Number of Students in the school had a significant relationship to reading growth. It seems logical that students who have the most growth or least growth in reading would also experience the same amount of growth in mathematics. Good students are typically strong in several academic areas while poor students typically struggle across multiple academic disciplines. Similarly, the relationship between the size of the school and reading growth seems to make logical sense to the researcher. One would surmise that schools with very small and very large numbers of 11th grade students would be negatively associated with gains because
small schools often lack appropriate resources and large schools generally tend to be more chaotic and unruly and students fall through the cracks.

Going into this study the researcher did not have any preconceived ideas as to which, if any, of the predictor variables being analyzed would be shown to have a relationship to the PVAAS Growth Index Score in reading. However, the review of literature pertaining to student achievement would lead one to predict that several of these independent variables may have a significant relationship to the dependent variable (reading growth) in this study.

As discussed in Chapter 2, there are a number of research studies on student achievement that cite the strong connection between factors such as poverty and race and student academic achievement; however, it is very important to make the distinction between this study, which looks at student growth, and previous studies that have focused on student achievement. William Sanders, the founder of the value-added assessment model, makes the claim that his model statistically controls and accounts for variables such as student race and socioeconomic status and eliminates those influences on student learning so that academic growth can be directly attributed to the effects of the school and teacher. The results of this study are mixed in regard to Sanders’ claims. Most of the predictor variables measured were not found to have a significant relationship with reading growth in Pennsylvania High Schools. Of the 19 variables measured in the two regression models, only six variables were determined to be significant with the three-year Mean Growth Index Score in reading. The independent variable, Percentage of Low-Income Students, which represents poverty, demonstrated a significant relationship with reading growth. However, race (particularly White, Hispanic, and Black), a predictor variable often attributed to student achievement performance in many research studies, was not found to be significant in its influence on reading growth.
Research to Practice

As a direct result from the information gleaned in this study the researcher has implemented program changes in his high school to raise expectations for students, staff and parents. First, next school year the technology preparation track will be eliminated in ninth grade giving more students access to a richer, college preparatory curriculum. To further assist these incoming ninth grade students, a freshmen academy will be created in the school to provide students with additional resources and supports as they enter the high school. In the academy students will be assigned to a team of teachers who will meet regularly to review student data and strategize on how to improve student academic achievement. Furthermore, special education, gifted, ESL, and literacy teachers will be assigned to the academy to work with the regular education teachers and assist with providing remediation and enrichment services for ninth grade students.

Next, in a further attempt to raise expectations and gather data on all of our students, all tenth grade students will take ACT’s PLAN test and all eleventh grade students will take the College Board’s PSAT at the beginning of the 2013-2014 school year. These tests will be administered during the school day and the costs will be covered by the school district. The results from the PLAN and PSAT will be used for career and post-secondary education planning and will also assist students in selecting a program of study at the high school.

Lastly, the faculty meetings this school year shifted from the traditional dissemination of information format to a professional development focus. In this transition year we have alternated between informational and professional development faculty meetings each month; however, next school year the intention will be to have most faculty meetings focus on building initiatives with a professional development component.
Recommendations for Future Studies

As with any research study there are limitations in regard to time, resources, and the scope of the research, and this study was no exception. The first recommendation for future study would be to expand the research to look at value-added growth models and their method of determining projected reading scores in other states. There are many states other than Pennsylvania that utilize value-added assessment growth models and projections. A research study that thoroughly explores the various value-added models being used across the country and measures their effectiveness would assist in determining how the Sanders model used in Pennsylvania compares to other states. Similarly, this study was limited to reading growth in PA public high schools only. The study could be expanded to explore PVAAS growth characteristics in charter, cyber, or private schools in Pennsylvania to compare their results with the public schools. Additionally, PVAAS information is available at the elementary and middle school levels and comparisons could be made between reading growth in each of these levels. Furthermore, the scope of this study was limited to high schools in PA. To include high schools across the country that exceed projected value-added growth in reading may provide additional school characteristics or programs that may have been missed in this smaller sample study.

Another aspect that can be further explored is the differences between high growth and small or no growth high schools in reading. The researcher for this study had the three-year Growth Index Scores for all high schools in the state and utilized all of these schools to examine the relationship between reading growth and the variables used in the quantitative component of this study; however, no additional information (i.e., survey or interview data) was obtained from these low performing schools. As one might expect, the researcher had difficulty finding principals in these negative-growth reading schools who would agree to participate in the study.
and it was a difficult subject for the researcher to pursue with his peers. Possibly a study comparing high growth and low growth high schools could be commissioned by the Pennsylvania or U.S. Department of Education, which would add some teeth to the study and require or strongly encourage participation from all principals and schools. Determining the differences in characteristics and programs between high growth and low growth high schools in reading would provide valuable information in the effort to help schools and students achieve at their maximum levels.

For this study the researcher only ran a multiple regression analysis using the enter method to look for relationships between the Growth Index three-year mean scores and the following variables: Special Education Percentage, Graduation Rates, School Wealth, and Race (White, Black, Hispanic, and Other). For a researcher looking to conduct a pure quantitative study, there are numerous variables that could be analyzed to determine their relationship to the reading Growth Index of the school. Many such variables were referenced throughout this study, particularly in the literature review; however, only the aforementioned variables and their relation to reading growth were measured in this study. This is certainly an area of study that warrants further investigation.

Lastly, for a researcher who desires to take a mixed methods approach to examining the characteristics and programs that are inherent in high growth reading schools, a more in depth analysis into one or more schools would be recommended. For this study the researcher limited his interactions and data gathering to the principals of the respective high schools. A future researcher could limit the number of schools that he/she examines; however, she could immerse herself within in the school and gather data from additional stakeholders including, district administrators, teachers, support staff, parents, and students. This study relied on the
information provided from the principals and gleaned from descriptive statistics and regression analyses; however, insights shared from other stakeholders would offer greater information and other perspectives regarding the characteristics and programs inherent in schools that lead to exceptional reading growth.

Conclusion

This study enabled the researcher to learn about the characteristics and programs that are prevalent in Pennsylvania high schools that exceed PVAAS growth projections on the PSSA. The literature review coupled with the actual research study provided the researcher with a greater knowledge and valuable insight into the value-added model, correlates of effective schools and school improvement strategies, effects of different variables on student achievement and growth, and the programs and characteristics of high growth reading high schools in Pennsylvania. It should be noted, that during the 2012-2013 school year, the Keystone Exams in literature, Algebra I, and Biology have replaced the reading, math, writing, and science PSSAs. Regardless, much of the information gleaned from this study aligns with best practice instructional approaches contained in the research and therefore will continue to promote increased academic achievement and growth in students and schools even as they transition to these new tests.

The researcher received information on these high growth schools from the sixty-five principals who completed the electronic survey and then coded the information to look for common practices and themes within the data. Additionally, six site visits and personal interviews with principals whose schools were in the top tier of reading growth provided the
researcher with an in depth perspective of what these schools are doing in order to attain such positive results.

The goal from the onset of this study was to review the research and gather and evaluate school specific data that would be useful to practitioners in the field (i.e., principals, teachers, etc.) who are searching for strategies, programs, or a framework to improve and grow the reading performance of students in their schools. While the results of this study do not provide one specific program or strategy that guarantees superior reading growth in students, common practices in these high growth high schools were identified that may be attributed to their excellent results.

In conclusion, this study afforded the researcher the opportunity to expand his knowledge of the characteristics and programs that exist in Pennsylvania High Schools that exceed PVAAS projections on the reading PSSA. The ultimate outcome is that educational practitioners will utilize the information gathered from the research and the findings of this study to improve the quality of their schools, which will in turn improve the academic achievement of their students.
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APPENDIX A-1: FIRST LETTER OF INVITATION

Will Stout
200 Stanley Avenue
Landisville, PA 17538
(717) 875-1512

Date

Dear Principal_______:

My name is Will Stout and I am the principal of Hempfield High School in Landisville, PA. I am presently working on my doctoral degree in Educational Leadership through Penn State University. As a high school principal myself, I realize how busy you are during the school year; however, I hope that you will be willing to assist me in my research by completing an on-line survey. Your participation in the survey is, of course, completely voluntary and anonymous. I will in no way be able to identify those who complete the survey.

I am conducting a research study that focuses on PA high schools that exceed the PA Value-Added Assessment System (PVAAS) projections for reading on the eleventh grade PSSA. You are receiving this request because your school exceeded the PVAAS projections in reading for the past three years. The purpose of the study is to determine the programs and characteristics present in schools that grow students beyond what is expected in the area of reading. In addition to the survey, I would also like to schedule a personal interview and site visit with several principals in the Central PA Region.

As previously mentioned, the intended outcome of this study is to better understand the characteristics and programs of high schools that exceed PVAAS growth projections in reading. While there is much research available on the characteristics of high achieving schools, there is a lack of information pertaining to high growth schools. As educators, I believe that it is our responsibility to continue to grow all students academically, regardless of their achievement level when they began in our schools.

Again, let me thank you in advance for your cooperation. I understand how busy you are but I also know that as principals we are always looking for data that may be helpful to us in improving the quality of our schools and programs to meet the needs of students. I believe that this study will provide such data. If you have any questions pertaining to this study, please contact me by email (wstout@comcast.net) or by phone at (717) 875-1512. You may also contact my dissertation advisor, Dr. Roger Shouse by email (rcs8@psu.edu) or by phone at (814) 863-3773.

Sincerely,

Will Stout
APPENDIX A-2: FOLLOW-UP LETTER OF INVITATION

Dear ____________________,

I am a student at Penn State University working on a doctorate in Educational Leadership. I am conducting a research study on PA high schools that exceed the PA Value-Added Assessment System (PVAAS) growth projections on the PSSA in reading. The purpose of the research study is to explore the programs and characteristics present in these schools that demonstrate exceptional growth.

Your participation will involve a semi-structured interview that will take one hour or less. A short follow-up interview or phone call may be necessary for clarification of your comments if needed. The interview will be tape recorded for accuracy. Participants will remain anonymous in perpetuity.

Your participation in the study is voluntary. Should you choose to withdraw from participation at any time you may do so without demur. The results of the study will be published as a dissertation, but your name will not be associated with any results.

This research poses no foreseeable risk to any of the participants in the study. In this research, there are no foreseeable risks. Although there may be no direct benefit to you, the possible benefit of your participation may help by providing educators nationwide with the opportunity to reevaluate the processes and programs in their schools.

If you have any questions concerning the research study, please call me at 717-875-1512 or email me at wstout@comcast.net

Sincerely,

Will Stout
APPENDIX A-3: CONSENT FORM FOR APPENDIX A LETTERS

By signing this form, I acknowledge that I understand the nature of the study, the potential risks to me as a participant, and the means by which my identity will be kept confidential. My signature on this form also indicates that I give my permission to voluntarily serve as a participant in the study described.

Signature of participant_______________________________________Date______________

Signature of researcher________________________________________Date____________
APPENDIX B: DEMOGRAPHIC SURVEY

This survey was designed to collect demographic information pertaining to schools that exceed PVAAS growth projections in reading. Data collected from this survey will be used for dissertation research purposes only. Please review and complete all questions listed on the survey. Once you have completed the web-based survey, please follow the instructions on your computer screen. Thank you for your help and support.

1. How many years have you served as the principal of this school?
   a) 1 to three-years
   b) 4 to 6 years
   c) 7 to 10 years
   d) More than 10 years

2. How many years have you been employed in the current school district in any capacity?
   a) 1 to three-years
   b) 4 to 6 years
   c) 7 to 10 years
   d) More than 10 years

3. How many years of experience do you have working as a principal for school districts?
   a) Less than three years
   b) 3 to 5 years
   c) 6-10 years
   d) More than 10 years

4. How many principals and assistant principals (including yourself) are in the high school?
   a) 1-2
   b) 3-4
   c) 5-6
   d) 7-8

5. Indicate your age range.
   a) 25-35
   b) 36-45
c) 46-55
d) 56-65
e) 66 +

6. What is your race?
   a) Caucasian
   b) African American
   c) Hispanic
   d) Asian
   e) American Indian
   f) Other

7. What is your gender?
   a) Male
   b) Female

8. What is your educational background?
   a) Bachelors degree
   b) Masters degree
   c) Doctorate degree

9. What is the overall student enrollment at your building?
   a) 500 or less
   b) 501 to 1000
   c) 1001 to 1500
   d) 1501 to 2000
   e) More than 2000 students.

10. What type of schedule does your school operate on?
    a) Traditional (7-9 periods per/day – 1 credit classes meet the entire school year)
    b) Block (4-5 periods per/day – 1 credit classes are semester based)
    c) Hybrid (classes are offered in both traditional and block schedules depending on the class)
    d) Other (please explain below)

11. How many high school credits do you require for students to graduate?
    a) 20-21
    b) 22-23
    c) 24-25
    d) 26-27
    e) 28-29
12. How would you classify your school
   a) Rural
   b) Suburban
   c) Urban

13. What percentage of your student population is identified for special education?
   a) 0 to 5%
   b) 6 to 10%
   c) 11 to 15%
   d) 16 to 20%
   e) 21 to 25%
   f) More than 25% of the student body.

14. What percentage of your student population is identified as English Language Learners (ELL)?
   a) 0 to 5%
   b) 6 to 10%
   c) 11 to 15%
   d) 16 to 20%
   e) 21 to 25%
   f) More than 25% of the student body

15. What percentage of your students are identified as economically disadvantaged (i.e., qualify for free and reduced lunch program)
   a) 0 to 6%
   b) 7 to 12%
   c) 13 to 18%
   d) 19 to 24%
   e) 25 to 30%
   f) More than 30% of the student body

16. What is the current status of your school in regard to Adequate Yearly Progress?
   a) Made AYP
   b) Warning
   c) School Improvement
   d) Corrective Action

17. If you did not make AYP in reading, which school indicators or subgroups did not meet the AYP threshold (Please select all that apply)?
   a) All Students
b) IEP Subgroup  
c) Economically Disadvantaged Subgroup  
d) ELL Subgroup  
e) Racial/Ethnic Subgroup  

18. Does your school have a mentoring program in place to assist students throughout high school?  
a) No  
b) Yes (please briefly describe below)  

19. Does your school require that students demonstrate proficiency in the reading standards (as demonstrated on the PSSA or district approved assessment) in order to graduate?  
a) No  
b) Yes  

20. Do you offer a test preparation program to prepare your students for taking the PSSA?  
a) No  
b) Yes (please briefly describe below)  

21. What Benchmark or Diagnostic Assessments do you utilize in your high school to measure student achievement and growth in reading?  
a) District developed benchmark (common) assessment.  
b) 4-Sight Assessment  
c) GRADE (Group Reading Assessment and Diagnostic Evaluation)  
d) Classroom Diagnostic Tools (CDT) – developed by the PA Department of Education.  
e) Other (please briefly describe below)  

22. What type of Tutoring or Remediation Program(s) do you use with students who score below proficient on the reading PSSA or other identified reading assessment?  
a) Tutoring or instruction outside the regular school day (before or after school)  
b) Pull out tutoring/remediation program during the school day (during a study hall or released from a class).  
c) Remedial reading class scheduled for credit.  
d) We don’t have a tutoring or remediation program available for students in reading.  
e) Other (please briefly describe)  

23. Does your school utilize one or more of the Reading Programs listed below to help struggling readers (Please select all that apply)?  
a) SuccessMaker
b) Fast ForWord  
c) Read 180  
d) Reading Apprenticeship  
e) Reading Plus  
f) We don’t have a reading program for struggling readers.  
g) Other (please briefly describe)

24. Does your school have a program in place to support reading across the curriculum as a school-wide initiative (e.g., sustained silent reading program, Reading Apprenticeship Model, etc.)?  
   a) No  
   b) Yes (please briefly describe this program below)

25. How does your school group students in the humanities subject areas (i.e., English and Social Studies)?  
   a) Homogenously (students grouped by ability level)  
   b) Heterogeneously (students of all ability levels in the same class)  
   c) Hybrid Structure (e.g., honors students or lower level students homogenously grouped while the majority of students are heterogeneously grouped). Please briefly explain this structure below:

26. Please explain why you believe your school grows students in reading at a rate much higher than what is predicted by the Pennsylvania Value-Added System of Assessment (PVAAS)?
APPENDIX C: INTERVIEW PROTOCOL

Part I: Notes for the Interviewer

Overview

1. Tape-record the interviews if permission is granted
2. Interview in a neutral setting.
3. Each interview lasted 30 to 90 minutes.

Interview Methodology

Interviews were implemented with a customized approach allowing for an in-depth investigation. Follow-up questions were used to stimulate interviewee memory. The interviewer used a semi-structured question design (Part III). Interview contained:

1. A predetermined set of 10-15 questions
2. All predetermined questions were the same for respondents

Designation of Interviewee: _______________________________________________

Location of Interview: _______________________________________________

Date: ________________

Start Time: ________________

Finish Time: ________________

Part II: Components of the Interview

1. Components of the Interview
   a. Introduction (5-10 minutes)
   b. Review confidentiality and consent form.
c. Create a relaxed environment

d. Dialogue

*Question:* Have you received my introductory correspondence explaining my research and the format that will be used?

*Question:* Are there any questions?

2. **Explain the purpose of the interview**

The purpose of this interview is to explore school level factors that impact your school’s growth level on the PSSA in reading. During the time we have together I would like to get an understanding of your experiences and observations pertinent to the subject matter of the study.

3. **Ask permission to record interview**

With your authorization, I would like to tape-record our discussion to get an inclusive record of what is said, since the notes I take will not be as comprehensive as I will require. No one other than I will listen to anything you say to me. Only I will have access to the records. The research results will describe what you and others have said predominantly in summation. No responses will be ascribed to you by name.

The open-ended questions are intended to obtain your personal experience and perceptions. The interview time may take about 1 hour. If you agree to volunteer and participate in the research process, please sign the informed consent page and confidentially agreement.

Would you give me permission to tape the interview?

Do you have any questions before we begin?

<table>
<thead>
<tr>
<th>Part III: Interview Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>The primary research questions and associated interview questions guiding the interviews follow.</td>
</tr>
</tbody>
</table>
Primary Question 1. *What programs and characteristics are common among the schools that exceed predicted academic growth in reading based on the PVAAS projections compared to actual PSSA scores?*

Demographic Questions. a) *How many students are in your building?* b) *Would you classify your school as rural, suburban, or urban?* c) *What is the percentage of non-white students?* d) *What is your percentage of ED students?* e) *What is the percentage of students with IEPs?* f) *What percentage of your students is ELL?* g) *How many teachers are in your building?* h) *What’s the approximate average age of experience of your staff?* i) *How many years do you have in education?* j) *How many years of experience do you have as an administrator?* k) *How many years have you been in this position?*

Interview Question 1. *Please describe in detail the major components of the reading program that you have in place in your school.*

Interview Question 2. *What programs do you have in place for students who are not performing at the proficiency level on previous PSSAs or benchmark assessments that you have in place? Are student deficiencies addressed in the regular education setting or through pullout remediation and tutoring programs?*

Interview Questions 3. *What, if any, benchmarks exams do you administer to the students in your school? Who is administered these benchmark assessments? How frequently are students given these benchmark assessments? Who receives the PSSA and/or benchmark data in your school? How is this data shared with teachers? Is the benchmark testing data shared with students?*
Interview Question 4. *Please describe the professional development plan that you have in place for the professional staff in your school. Are there specific literacy programs and/or instructional strategies that are emphasized in your professional development plan?*

Interview Question 5. *How do you ensure that faculty members are held accountable for teaching reading across the disciplines?*

Interview Question 6. *Does your school district have a prescribed K-12 literacy initiative or is it different by school or grade levels? Please explain.*

Interview Question 7. *What is your role as the building level principal in developing and establishing the literacy vision and plan for your school?*

Interview Question 8. *Who in addition to yourself has a leadership function in developing the literacy plan for your school and ensuring that the reading initiatives are understood and followed by the staff?*

Interview Question 9. *Please, in your own words, describe why you believe that the students in your school are able to grow in reading at a much higher rate that predicted by the PVAAS Projection Model?*

Interview Question 10. *Is there any additional information that you would like to share with the researcher about your school that you believe would be beneficial for this study?*
Appendix D: Interview School/Principal Demographics:

<table>
<thead>
<tr>
<th>Principal</th>
<th>No. of Students</th>
<th>No. of Teachers</th>
<th>Classification of School</th>
<th>*PVAAS Growth Ranking</th>
<th>% Non-White</th>
<th>% ED</th>
<th>% IEP</th>
<th>% ELL</th>
<th>Yrs. of Admin. Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1850</td>
<td>120</td>
<td>Suburban</td>
<td>28</td>
<td>25</td>
<td>15</td>
<td>8</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>B</td>
<td>2548</td>
<td>200</td>
<td>Suburban</td>
<td>7</td>
<td>10</td>
<td>10</td>
<td>12.5</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>C</td>
<td>1100</td>
<td>110</td>
<td>Suburban</td>
<td>5</td>
<td>15</td>
<td>8</td>
<td>20</td>
<td>1</td>
<td>18</td>
</tr>
<tr>
<td>D</td>
<td>1230</td>
<td>131</td>
<td>Suburban</td>
<td>1</td>
<td>11</td>
<td>8</td>
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</tr>
<tr>
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<td>5</td>
<td>12</td>
<td>18</td>
<td>1</td>
<td>16</td>
</tr>
</tbody>
</table>

*The PVAAS Growth Ranking was calculated using the mean growth index scores in reading from 2009, 2010, and 2011.*
Wilbur Stout was born in Boyertown, Pennsylvania on November 3, 1968. After finishing high school in 1986, he attended Temple University and graduated in 1991 with a Bachelor of Science Degree in Education. He later attended Kutztown University and in 1995 earned a Master of Education Degree in School Counseling. Mr. Stout began his career in education as a school counselor in the Hempfield School District. In 1999, he received his principal certification from Penn State University and in January 2002 began his administrative journey as an assistant middle school principal in the Hempfield School District. Mr. Stout enrolled in the Educational Leadership Doctoral Program at Penn State University in 2005. He has made his way through the administrative ranks in the Hempfield School District serving as an assistant middle school principal, acting middle school principal, assistant high school principal, associate high school principal, and has been in his current role as high school principal since July 2008.