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Relationships Between Teacher Perceptions Of Principal Leadership And Student Achievement In Kentucky Appalachian High Schools

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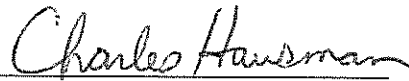
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RELATIONSHIPS BETWEEN TEACHER PERCEPTIONS OF PRINCIPAL
LEADERSHIP AND STUDENT ACHIEVEMENT IN KENTUCKY APPALACHIAN
HIGH SCHOOLS

By

James Dantic

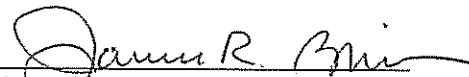
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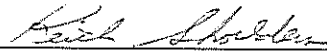
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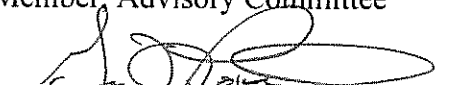
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RELATIONSHIPS BETWEEN TEACHER PERCEPTIONS OF PRINCIPAL
LEADERSHIP AND STUDENT ACHIEVEMENT IN KENTUCKY APPALACHIAN
HIGH SCHOOLS

By

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DEDICATION

I wish to dedicate this research to my parents for their encouragement and support throughout the years and my family for their patience during this process.

ACKNOWLEDGEMENTS

I wish to acknowledge the support of my family through this academic process. There were many evenings and weekends when I was not around to be a part of events and activities due to this endeavor, and I thank them for their patience.

I also wish to thank my parents for their unwavering support throughout my educational career as well as all other life engagements. Their unconditional encouragement and backing has provided me with limitless opportunities.

I am appreciative for my colleagues and classmates who have provided me with added confidence, acceptance, a variety of perspectives, and buttressed me as we moved through both professional and personal challenges.

I wish to thank my dissertation committee for their guidance and support; Dr. Herlihy whose unique character and genuine demeanor has provided me with much practical guidance as an educator, Dr. Keith Shoulders' pragmatic counsel and humorous perspective who serves tirelessly as a sounding board for my rants, Dr. Deborah West who provided helpful insights and patience through this process and Dr. James Bliss for his support in the latter stages of this project. Most importantly, I am indebted to Dr. Charles Hausman who has fostered me through this process as both a mentor and colleague. He has pushed me to grow as a student, a leader and an educator.

ABSTRACT

High Schools located in Kentucky's rural Appalachian region have historically performed below average on national and state assessment instruments. These schools are located in a geographically isolated region with high unemployment, almost stagnant population growth and limited economic resources. Principals of these Kentucky Appalachian Schools are charged with raising student achievement and ensuring college and career readiness for all students in this challenging environment.

This correlational research examines principal leadership as determined by teacher responses on Kentucky's 2011 TELL survey and its relationship with student achievement as defined by school level performance on 2011 ACT and gains in student performance between 2010 PLAN and 2011 ACT. Principal leadership is categorized into operational, instructional and cultural dimensions as well as collectively. The study also reviews the relationship between student achievement and school characteristics of total student enrollment, per pupil expenditure, teacher education level, free/reduced lunch eligibility and school leadership.

Kentucky Teacher TELL survey responses regarding Appalachian high school principal behaviors related to school culture received the lowest mean scores while instructional leadership garnered the highest rating. Survey responses also presented strong positive correlations existed among the three leadership dimensions and overall leadership. Additionally, linear regressions of the leadership dimensions and overall leadership did not predict student achievement on the ACT or gains from the PLAN to the ACT. Finally, regressions of the school characteristics indicated that only the

percentage of students eligible for free and reduced lunch was a significant predictor of Appalachian student performance on the ACT and PLAN/ACT gain.

KEYWORDS: ACT, Appalachia, cultural leadership, free and reduced lunch, gains in PLAN/ACT, instructional leadership, Kentucky TELL survey, operational leadership, Rank I, student achievement

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CHAPTER 1: INTRODUCTION

The Kentucky legislature's passage of the *Act Relating to Student of Achievement of 2009*, often referred to as Senate Bill 1, mandated significant changes in public school accountability. One key aspect of this legislation focuses on educators' ability to ensure K-12 students' career and college readiness. Senate Bill 1 specifically outlines that failure to demonstrate consistent student achievement in pursuit of career and college readiness can result in the removal of school councils, up to 50 percent of a school's faculty, and school principals. A tool used to measure the academic readiness of all Kentucky public high school students is the American College Testing instrument, or ACT exam. This research sought to determine if teachers' leadership ratings of Kentucky principals who serve in high schools located in Appalachia correlated with student achievement as defined by student performance on the American College Testing Exam (ACT).

Kentucky's Appalachian Region

Kentucky's Appalachian region has been identified by many as an area which is rich in environmental beauty and natural resources. Conversely, citizens of this section of the Commonwealth suffer from a geographic sense of isolation as well as conditions of high poverty, deindustrialization, inadequate infrastructure, limited tax base support, and stagnant population growth (Eller, 2008). The region has remained almost exclusively rural in composition with limited commercial development in the small towns which speckle the counties of Appalachia with each physically interconnected primarily by narrow, hilly, winding two lane roads.

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The 54 counties identified by the Appalachian Regional Commission which comprise Kentucky Appalachia cover 18,231 square miles or almost one half of the state (Appalachian Regional Commission, 2011a, 2011b, 2011c, 2010; Pollard & Jacobsen, 2012; United States Census Bureau, 2010). Although this region makes up 46 percent of the total land mass of the Commonwealth, it accounts for only 27 percent of the population. According to the 2010 United States Census and presented in Table 1.1, median household incomes and per capita incomes are well below the state and national averages, while the poverty rate is significantly higher. Additionally, as noted in Table 1.2, the age distribution of the inhabitants in these Kentucky Appalachian counties shows a more aged population with higher representation of citizens over 64 years of age as well as a median age which is two years older than that of the state or nation. This region only increased 2 percent in population during the last decade compared to 7.4 percent and 9.7 percent respectively for the state and nation (United States Census Bureau, 2010).

Table 1.1

2010 Household, Family, and Per Capita Income

	Mean Household Income	Median Household Income	Family Mean Income	Family Median Income	Per Capita Income
United States	70,833	51,914	82,446	62,982	27,334
Non Appalachian Kentucky	60,356	45,527	71,559	57,301	24,373
Appalachian Kentucky	44,246	31,521	52,194	40,042	17,638

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Table 1.2

2010 Age Distribution of Populations

	Under 18	18 – 24	25 – 64	Over 65	Median Age
United States	24.4 %	9.9 %	53.0 %	12.7 %	36.9
Non Appalachian Kentucky	24.1 %	9.7 %	53.5 %	12.7 %	37.2
Appalachian Kentucky	23.1 %	9.2 %	53.6%	14.1 %	39.0

Source: United States Census. (2010). Washington, D.C.: United States Government Printing Office.

Low population growth can be partially attributed to the economic conditions of this area, which are tightly linked to coal extraction (Eller, 2008). With the increased use of machinery in place of manual labor, narrowing of existing coal mining seams and reduction of labor union influence, employment opportunities in this industry have seen a steady decrease over the last three decades. As indicated in Table 1.3, Appalachian poverty rates and unemployment rates are well above the national and non-Appalachian Kentucky averages. In 2011, the Appalachian Regional Commission identified 50 of the 54 Kentucky Appalachian counties as either economically distressed or at-risk due to stagnant economic growth, restricted access to capital, and limited employment opportunities (Appalachian Regional Commission, 2013; Pollard & Jacobsen, 2012; United States Census, 2010). As a result of these economic conditions, this region of Kentucky suffers from poverty rates and unemployment rates which are greater than the rest of the state and the nation.

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Table 1.3

2010 Poverty, Unemployment Workforce Rates, and Population Comparison

	Unemployment Rate	Poverty Rate	Workforce Age 25 - 64	Total Population	Population Growth
United States	6.4 %	13.8 %	78 %	303,965,272	9.7 %
Non Appalachian Kentucky	6.4%	15.1 %	76.2 %	3,103,189	7.4%
Appalachian Kentucky	7.6%	24.4 %	61.2%	1,182,639	2.0 %

Source: United States Census. (2010). Washington, D.C.: United States Government Printing Office.

Education in Kentucky Appalachia

Similar to the limited economic opportunities, public education in Appalachia is also constricted by the same conditions of geographic isolation, poverty, limited local tax revenues and the inconsistency of family members to support their children’s formal education due to their own limited experiences, values and scholastic ability. The combination of these conditions makes educating the 190,000 school aged children particularly challenging.

Most of the 72 Kentucky public school districts in the Appalachian region are county based with a few smaller independent districts still in existence. Reflective of these counties’ low population density, the average school district enrollment in Kentucky Appalachia is 2,564 students with high school enrollments ranging from 91 to

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1699 students and averaging 675 students per secondary school (Kentucky Department of Education, 2011c).

Kentucky High School Student Performance

Student performance on Kentucky and national assessments has seen individual school advances at the elementary and secondary levels, but as a whole, high school students in the Appalachian region perform lower on these instruments. For example, of the 87 Kentucky Appalachian high schools administering the state required ACT to students in the spring of 2011, less than one fourth of the schools' composite average scores for all students enrolled was at or above state average (M = 18.8.) and only one high school's ACT composite score was above the national average for the year (M = 21.1) (Kentucky Department of Education, 2011b). Kentucky high schools in the Appalachian region averaged a composite ACT score of 18.1 during the state's 2011 administration of the exam.

The ACT exam administered to Kentucky high school juniors each spring also provides students and schools with college readiness indicators in the areas of English, math and reading. The threshold ACT scores to meet college readiness in 2011 were 18 in English, 19 in Math and 20 in Reading. In each of these categories, Kentucky students proved less prepared than their national counterparts, and student scores in the Kentucky Appalachian region indicate even lower college readiness than the state average as presented in Table 1.4 (Kentucky Department of Education, 2011a; ACT, 2011).

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Table 1.4

Percentage of Students Meeting ACT College Readiness Benchmark Scores

Student Population	English	Math	Reading	Composite
United States	66%	45%	52%	54%
Kentucky	49.5%	36.2%	39.8%	41.8%
Kentucky Appalachia	45.8%	29%	36%	36.9%

Source: ACT. (2011). 2011 ACT national and state scores: College readiness benchmark attainment by state [Data file]. Retrieved from <http://www.act.org/newsroom/data/2011/benchmarks.html>

Kentucky Education Reform in the Twenty-First Century

In the spring of 2009, the Kentucky legislature approved a significant piece of legislation aimed at increasing student academic performance, ensuring greater educator accountability, and measuring school progress (Act Relating to Student Assessment, 2009). Senate Bill 1 called for a realignment of state K-12 student instruction and assessment with national performance standards, as well as greater work force and college readiness among Kentucky secondary students. Increased emphasis was to be placed on secondary and post-secondary collaboration that would develop and support early intervention strategies for individual secondary students who presented inadequate progress in mastery of Common Core curricula and inadequate college readiness performance on state supported and administered ACT examinations of all public school juniors.

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In order to support state intervention in schools that demonstrated a long term lack of progress in these academic areas, Kentucky Revised Statute 160.346 and 703 Kentucky Administrative Regulation 5:180 were developed in 2010. This first law allowed for direct intervention and oversight by the Kentucky Department of Education as well as the possible removal of teachers, school councils and principals from their positions in “persistently low-achieving schools” as noted in KRS 160.346. Additionally, state interventional activities outlined in 703 KAR 5:180 placed significant emphasis on determining leadership capacity and effectiveness in advancing low-achieving schools.

Application of KRS 160.346 and 703 KAR 5:180 during the 2010 academic year resulted in the Kentucky Department of Education identifying 11 high schools as persistently low-achieving (PLA) and requiring state intervention (Kentucky Department of Education, 2010). Six were located in the Louisville Metro Area, and three were in the Appalachian region. The following year the Kentucky Department of Education recognized 14 additional low performing high schools, and half of these newly identified schools were located in Appalachia (Kentucky Department of Education, 2011g). During the first two year identification and intervention process, 10 of this region’s 81 high schools were identified as not only performing below standard but doing so for a series of years without significant improvement in student achievement. The ensuing state intervention resulted in leadership assessment teams being assigned to failing schools to evaluate leadership effectiveness and determine specific interventions necessary to improve student academic performance in the school, including the possibility of external oversight of the school by a school management organization, re-staffing of up to 50

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percent of the faculty, removal of the principal, replacement of school council members, and even closure of the school as noted in KRS 160.346.

Much of Kentucky's approach to addressing persistently low-achieving schools centers on an examination of school level leadership. For example, leadership review teams identified in 703KAR 5:180 are expected to evaluate principals using the following criteria:

(2) The assessment team shall make a determination of the school council's and principal's ability to lead the intervention in the school based upon the following criteria:

- (a) The school leadership's ability to function as an effective learning community and support a climate conducive to performance excellence;
- (b) The school leadership's ability to actively engage families and community groups to remove barriers to learning in an effort to meet the intellectual, social, career, and developmental needs of students;
- (c) The school leadership's ability to focus its professional learning program primarily on job-embedded professional learning;
- (d) The school leadership's ability to make instructional decisions that focus on support for:
 - 1. Teaching and learning;
 - 2. Organizational direction;
 - 3. High performance expectations;
 - 4. Creating a learning culture;
 - 5. Developing leadership capacity.
- (e) The school leadership's ability to organize the school to maximize use of all available human and fiscal resources to support high student and staff performance; and
- (f) The school leadership's ability to effectively:
 - 1. Identify the needs of all students;
 - 2. Set specific, measurable goals to address those needs;
 - 3. Implement specific strategies to reach those goals;
 - 4. Provide adequate resources to implement those strategies;
 - 5. Frequently monitor implementation of the strategies and make adjustments when strategies are not achieving the desired outcomes.

(3) The school leadership assessment shall utilize:

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- (a) The standards and Indicators for School Improvement incorporated by reference;
 - (b) The Missing Piece of the Proficiency Puzzle incorporated by reference;
 - (c) Classroom observations;
 - (d) Stakeholder interviews;
 - (e) Teacher and principal working conditions survey; and
 - (f) Portfolio of school records.
- (4) The assessment team shall submit a report to the Commissioner of Education that specifically makes recommendations regarding whether the:
- (a) School council has the capability and capacity to continue its roles and responsibilities established in KRS 160.345; and
 - (b) Principal has the capability and capacity to continue his or her roles and responsibilities established in KRS 160.345, or whether the council shall be retained in an advisory capacity, and if retained, whether the current membership of the council shall be replaced by the Commissioner of Education (703 KAR 5:180).

Through this process, the school leadership assessment teams are to identify elements associated with school leadership that are deficient or causal factors in the poor academic performance of students enrolled in the school under review. This school assessment team wields considerable power in not only determining the interventional strategies that school staff and administrators are to implement in order to improve the school's scholastic performance but also the involvement of the current school council and the continued employment of current teachers and administrators at schools identified as persistently low-achieving.

This regulatory legislation involved in addressing persistently low-achieving schools establishes a direct one dimensional link not only between effective teacher instruction with increased student performance but an equally important relationship which parallels effective school leadership with increased student performance. External community, economic, cultural and familial conditions that may influence student

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performance do not factor in the determination of successful instruction or leadership of a school. This places school administrators who work in districts with increased community risk factors, similar to those which exist in much of Appalachia (high poverty, low levels of citizen education, limited resources, low tax base and high unemployment), in a particularly challenging position.

Appalachian high school principals currently find themselves serving in an environment in which cultural, regulatory, financial and educational conditions have generated professionally demanding circumstances. Students and communities for whom these school leaders serve offer limited resources and support, often coupled with a cultural and educational legacy of low achievement. State and national assessment expectations continue to serve as the primary drivers in policy development at most levels of education. Equally, legislatively created regulatory interventions place the oversight of a principal's school in jeopardy, not to mention his or her own employment if academic progress cannot be consistently demonstrated.

Though many of these conditions with which school administrators must function are externally imposed elements, principals continue to possess significant influence on the operational and instructional capacity of the schools which they lead. Specifically, effective leadership has been identified as having a positive influence on student achievement by a number of researchers (Bossert, Dwyer, Rowan, & Lee, 1982; Hallinger & Heck, 1998; Leithwood, Patten, & Jantzi, 2010; Witziers, Bosker, & Kruger, 2003). Additionally, the Wallace Foundation's research (Leithwood, Louis, Anderson & Wahlstrom, 2004) addressing effective school leadership and student learning determined that school principals are instrumental in implementing reform and increasing student

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academic performance and further noted that the impact of effective school principals was most significant in high poverty environments similar in characteristics to those of the Appalachian region.

Study Rationale

Appalachian secondary school principals must demonstrate sustained academic growth based heavily upon state and national assessment instruments. These results are used in part to determine if students are prepared for successful post-secondary education or career and technical avenues. The Appalachian region presents unique characteristics in terms of cultural values that do not place as great a value on education, historically low student academic performance, and limited economic and social resources (Eller, 2008; National Center for Education Statistics, 2010). Most research regarding the effect of school leadership on student achievement does not address rural or Appalachian environments or schools. Thus, this study addresses a significant gap in the educational leadership literature.

Research Purpose

The purpose of this study was to determine if teachers' ratings of Kentucky principals who serve in high schools located in Appalachia are correlated with student achievement as defined by student performance on the American College Testing (ACT) Exam. Specifically, this research determined if specific operational, instructional and culturally based leadership behaviors rated on a statewide teacher survey predict student achievement. This statewide electronic survey is the Teaching, Empowering, Leading and Learning Working Conditions Survey (TELL), which was first administered by the Kentucky Department of Education in the spring of 2011. The TELL survey provides

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teachers with the opportunity to voluntarily rate a variety of characteristics and conditions in the schools which they serve. At the conclusion of the electronic survey, schools are provided with the collective data that can be used to develop school improvement plans.

The correlation between leadership behaviors and student achievement has significant ramifications for school principals in relationship to the 2010 legislation as embodied in KRS 160.346 and 703 KAR 5:180. Specifically, schools that demonstrate low student achievement resulted in state intervention and the removal of principals from their leadership positions as based on the state's new accountability system, the Kentucky Performance Rating for Educational Progress (KPREP). The KPREP accountability system provides schools with student academic performance indicators in the areas of gap reduction, student growth and student achievement with the later indicator including collective student ACT performance for each high school. For Kentucky Appalachian high school principals who often serve in a historically lower academically achieving region, this relationship between leadership and student achievement presents obvious concerns.

Research Design

This research study utilized a correlational research design. The dependent variable was the 2011 mean composite ACT score at the school level. Individual Appalachian high school principals' behaviors associated with school operations and culture were harvested from the Kentucky Department of Education's (KDE), TELL (Teaching, Empowering, Leading and Learning) survey, which was located on KDE's website. This survey was administered to all Kentucky teachers during the 2010-2011 academic year. This study sought to determine if specific leadership behaviors as

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reported by teachers on the TELL survey are related to student performance on the ACT examination.

Research Question

The following questions were addressed in this research study:

- 1) What is the relationship between teacher ratings of principal leadership as identified through the 2011 TELL survey and student achievement on the ACT examination in Kentucky Appalachian high schools?
- 2) What is the relationship between teacher ratings of principal leadership as identified through the TELL survey and student performance between gains from 2010 Sophomore PLAN school composite scores to the 2011 Junior ACT school composite scores?
- 3) What is the relationship between teacher ratings of principal leadership in the areas of cultural, operational and instructional leadership as identified by the 2011 TELL survey and student achievement on the ACT school composite score in Kentucky Appalachian high schools?
- 4) What is the relationship between per pupil expenditure, teacher education level, free/reduced lunch eligibility, student enrollment, and principal leadership as identified by the 2011 TELL survey with student achievement on PLAN and ACT examinations for Kentucky Appalachian high school students?

Several null hypotheses from these questions emerged:

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- 1) There is no relationship between teacher ratings of principal leadership on the TELL survey and student achievement on the ACT examination of Kentucky Appalachian high schools.
- 2) There is no relationship between principal leadership on the TELL survey and student performance gains between 2010 Sophomore PLAN school composite scores and 2011 Junior ACT school composite scores.
- 3) There is no relationship between teacher ratings of principal leadership in the areas of cultural, operational and instructional leadership as identified by the 2011 TELL survey and student achievement on the ACT examination in Kentucky Appalachian high schools.
- 4) There is no relationship between per pupil expenditure, teacher education level, free/ reduced lunch eligibility, student enrollment and principal leadership on the TELL survey with student achievement on PLAN and ACT examinations for Kentucky Appalachian high school students

Definition of Terms

Appalachia—The region named for the Appalachian mountain range which forms a geographic crescent shape from New England through northern Georgia and Alabama.

ACT—An acronym for American College Testing, this assessment serves as one of the United States' main college entrance exams and all Kentucky students in the spring of their junior year are required to take it as part of the state's accountability system.

EXPLORE—A standardized assessment marketed by ACT that is administered to Kentucky 8th graders and measures performance in math, English, reading and science.

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FREE AND REDUCED LUNCH – This proxy for income includes students whose families apply and qualify under the National School Lunch Act to receive either free or reduced price meal service from their local school based upon their family income.

KDE—Kentucky Department of Education.

KPREP—An acronym for Kentucky’s statewide school assessment system implemented in 2012 (Kentucky Performance Rating for Educational Progress), which measures student achievement, student growth and gap performance at different grade levels.

PLAN—A standardized assessment marketed by ACT that is administered to Kentucky 10th graders and measures performance in math, English, reading and science. It provides predictive student data aligned with ACT assessment performance.

PER PUPIL EXPENDITURE—Calculation of school and district expenses divided among the total student population being served as determined by the district.

RANK I—Educational designation assigned by the Kentucky Educational Standards Board which indicates 60 hours of approved graduate credit or acquisition of National Board teaching certification, have been earned.

TELL—A school working conditions survey (acronym for Teachers Empowering, Leading and Learning) that all Kentucky teachers were encouraged to voluntarily complete during the spring of 2011 by the Kentucky Department of Education. This survey sought to provide anonymous teacher feedback to schools about: (1) use of time; (2) facilities and resources; (3) community involvement; (4) student management; (5)

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teacher leadership; (6) school leadership; (7) professional development; (8) instructional practices and support; and (9) new teacher support.

CHAPTER 2: LITERATURE REVIEW

Appalachia is a unique region that frames the cultural and environmental context in which this research was embedded. Upon further study, one comes to recognize that this area of Kentucky and its people possess characteristics that in some aspects influence education differently from those factors which impact the instruction of inner city children from Louisville or perhaps even the students who reside in non-Appalachian rural areas. The context of Appalachian culture and history plays a role in both how education has developed in this region of Kentucky and how it currently operates.

The Appalachian region of Kentucky rests in the mountainous eastern half of the state, and its geographic features have historically served to isolate the region from external state and national influences (Caudill, 1963; Eller, 2008). Its unique topography has also limited agricultural potential and made its citizens reliant on natural resources such as timber and coal as a means of commercial existence. Equally, population density is comparatively low for the Appalachian region relative to Kentucky as a whole and has resulted in small isolated communities with limited economic and population growth. As a result of these conditions, public education has evolved in its own unique fashion during the last century through the consolidation of community controlled school houses into single county-managed schools. Even with consolidation, these schools are relatively small with high schools in the region averaging enrollments under 700 students (Kentucky Department of Education, 2011h). Similarly, the lack of economic opportunity and limited tax base has resulted in schools with narrow curricular programming and sustained free and reduced lunch programs which on average serve in excess of 60 percent of the student body (Kentucky Department of Education, 2011e). Finally, the

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Appalachian culture presents its own challenges with its wariness of external and nontraditional influences and inward focused values which are not aligned with competition and consumerism but instead with stability and familial connectedness (Eller, 2008; DeYoung, 1987). These conditions should be acknowledged and understood by school leaders who serve Appalachian public schools, as these factors influence student performance, parent expectations and perhaps even the pedagogy of local educators. Though student achievement continues to be the common goal of all educational leaders, the pursuit of this end by Appalachian principals should incorporate operational and cultural modes at the school level to which teachers and students recognize and respond. Failure to recognize these Appalachian based influences could decrease effectiveness of leaders and educators serving Kentucky Appalachia students. The leadership, school and Appalachian contextual variables affecting student achievement are highlighted in Figure 2.1, which served as the conceptual framework for this study.

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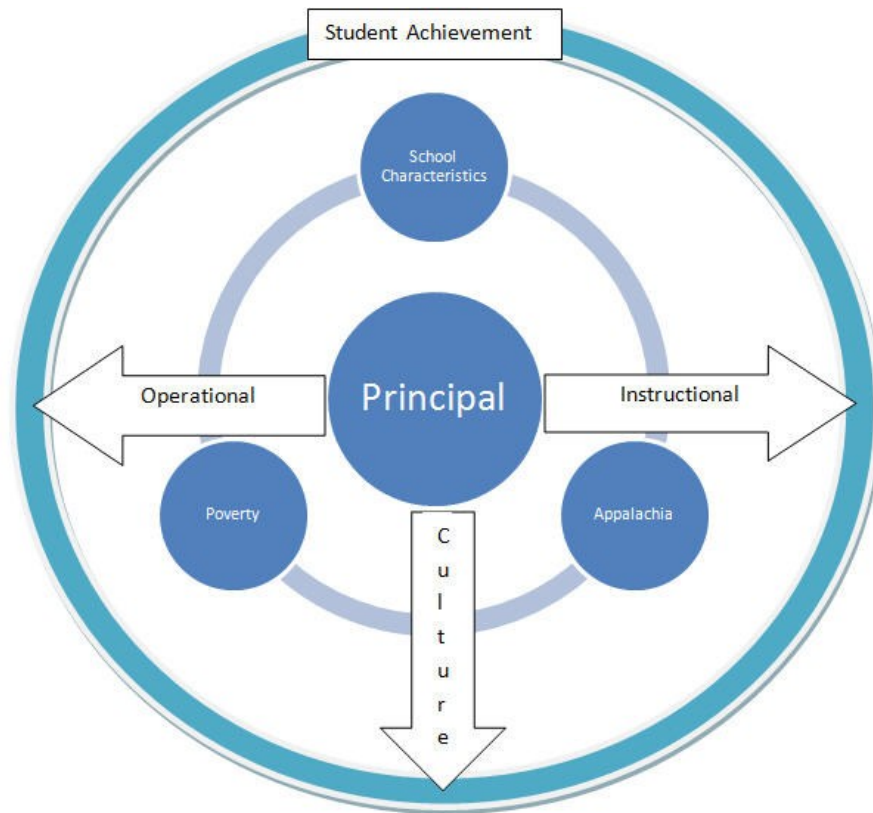


Figure 2.1. Kentucky Appalachian Principal Leadership Frame

Appalachian History

Early works about Appalachia portray a region ranging from exploitation to existentialism. *Night Comes to the Cumberland*, by Caudill (1963), portrays the native Appalachians as poor, simple-minded folks who are as easily taken advantage of as is the region's land that is exploited by big coal companies. It is a culture of rural traditions held closely by independent people but challenged by the encroaching forces of mechanization, commercialization, social homogenization and urbanization which the coal towns brought to the region. Caudill (1963) portrays mid twentieth century Appalachians as placing little value on education beyond basic reading and math skills.

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Similarly, Weller's (1965) *Yesterday's People*, which was also written during the 1960s, hypothesized that inhabitants from the region place greater significance on people than objects and that education was aligned with the later identity. Weller's theory highlights the stereotypes imposed by mainstream perceptions about Appalachian employment, development, sociopolitical engagement and community. Weller notes that this perception served as a prohibiting factor in the acceptance and development of contemporary or non-native behavior and values.

A more contemporary overview of the Appalachian region during the post-World War II era can be found in Eller's (2008) *Uneven Ground*. This book identifies the elements that have contributed to Appalachia's current conditions. Eller points out that the midcentury influx of resources associated with small scale manufacturing and expanded coal mining did not result in the development of infrastructure or broad-based rises in household incomes noting that "too often...we have mistaken growth for development, change for progress" (p. 5). The exploitation of resources by mining and timber companies resulted in not only environmental and economic debilitation, but nurture a reluctance to trust or accept external influences.

As Eller (2008) points out, initiatives for the region such as President Kennedy's Appalachian Regional Commission and President Johnson's Appalachian Regional Development Act met with only limited success. Eller believes these shortcomings were due in part to local political mismanagement, externally crafted policies based solely on anti-poverty initiatives, and the efforts to acculturate people of the region to contemporary American stereotyped identities and behaviors. This period of attempted federal intervention resulted in a backlash of social activism that sought to protect the

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Appalachian land, its people and its identity from outside homogenization and exploitation, as well as internal corruption and ineptitude by its leaders.

In 1965, the Appalachian Regional Commission was established by Congress as a federal agency, and it ushered in another attempt by Appalachian governors and federal leaders to modernize and economically grow Appalachian areas that offered the most promise for development (Eller, 2008). These efforts also failed to bring significant prosperity or transformation to Appalachia and the region continued to suffer economic hard times near the end of the century. Much of this stagnation was due to the slowing of coal production, reductions in manufacturing and greater mechanization in coal extraction, population migration, decreases in tax bases, continued environmental damage, political mismanagement and increased drug abuse. Ironically, Eller (2008) believes that Appalachia is no longer a dysfunctional region trapped in a violated and misunderstood past existence but instead is a model upon which the rest of the country should study in order to collectively avoid a similar fate.

Appalachian Education

Kentucky's public education system slowly and unevenly evolved through the twentieth century. Early on, most Kentucky students were educated in rural areas in one room school houses located in over a thousand local districts which existed in Kentucky prior to World War I (Harrison & Klotter, 1997). In general, teachers in Kentucky a century ago were usually poorly compensated, poorly prepared and poorly resourced, with many seeking teaching positions only as a temporary alternative. Local trustees controlled both taxation as well as school staffing, which resulted in political and familial factors often playing a more significant role than knowledge and ability when selecting

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teachers. Similarly, most school buildings were primitive at best and certainly not adequately maintained or supplied.

Poverty and geography made widespread public education even more inadequate in the Appalachian region during the early twentieth century (Ellis, 2011). Some of the first schools established in the mountains and hollows of the area evolved out of the urban reform movement of the northeast in the form of settlement schools, many of which were founded and funded by churches and missionary societies. Remote settlement schools were often staffed by educated young graduates from the northeast. Another source of education for Appalachian children came as a byproduct of their parent's employment in coal towns and camps. Coal companies constructed towns near their mines where workers and their families could live, shop, socialize, and children could attend school provided and controlled by the company.

By the end of the First World War, over 7,000 one room school houses controlled primarily by local officials served to educate children in Kentucky's rural areas (Gifford, 1992). Within these primitive structures, individual teachers worked to educate children of all ages in a variety of content areas. As the century progressed, the one room school houses that scattered across the Commonwealth dwindled as county control of education led to school consolidation. A few independent districts were able to survive though only through local financial support, but most community schools found the expense of operation coupled with growing instructional expectations too difficult to sustain. By 1970, there were less than 150 one room school houses still in operation, and in 1989, the last one located in Appalachian Floyd County closed.

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As Ellis (2011) in *A History of Education in Kentucky* and Eller (2008) in *Uneven Ground* point out, school consolidation was viewed by educational leaders as a means of saving money, constructing larger facilities comparable to those found in larger urban areas, and expanding course offerings for students. Unfortunately, these initiatives to consolidate often caused the most harm to the small, isolated rural communities, which saw their community elementary and high schools shuttered and their students bussed to one central location that was often near the county seat. With the loss of smaller local schools that were once a central point of pride and community activities, families from outlying areas found it more difficult to participate in school programs. Equally, rural students often found the larger classes and student populations, as well as the emphasis on competition and consumerism, alienating. Just as this environment served to disenfranchise rural students, so too did citizens lose their voice and control formerly enjoyed through engagement in their community school. Additionally, as Boyd and DeYoung (1986) note, “The net result of school consolidation in much of Appalachia has been to disenfranchise local citizens groups from control of their schools while enabling school officials to carve out a niche as educational experts at the county level” (p. 282).

Complicating matters further, the Appalachian region struggles to recruit qualified teachers to local school districts which are usually in the greatest need of instructional transformation (Proffit, Sale, Alexander, & Andrews, 2004). Competition from larger urban and suburban school districts which often offer higher salaries, greater access to social and commercial resources and more professional opportunities for growth make recruitment of teachers to Appalachia challenging.

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Appalachian Student Performance

In addition to early twentieth century schools being inadequate, Kentucky school teachers in the Appalachian region were often untrained, less educated and poorly supported. In a 1935 U.S. Department of Agriculture survey of the region, it was determined that one in five students under the age of 15 did not attend school, and of those students older than 15 years of age, only about 30 percent were enrolled in school (United States Department of Agriculture, 1935). Additionally, the schools were often staffed by teachers who did not possess even high school diplomas and were often paid half of what their urban counterparts received. Another survey conducted by the Southern Appalachian Studies Division of Research in 1962 noted that the percent of uncertified teachers serving Appalachia was three times higher than the national level, and the tax dollars spent on supporting education were proportionately about half the national average (Ford, 1962).

In what was perhaps the first comparative review of Kentucky Appalachian student academic performance on a national standardized assessment, DeYoung, O'Brien and Vaught (1981) analyzed Appalachian student performance on the Comprehensive Test of Basic Skills (CTBS) in 1981. Part of this research compared the performance in mathematics, reading and language arts of Kentucky Appalachian students with their non-Appalachian counterparts in grades three, five, seven and ten. The results indicated that Kentucky students educated in Appalachian schools not only scored lower than their non-Appalachian counterparts in all three areas, but had a much higher proportion of students performing in the below average range. When reviewing the region's percentage of high school graduates and college graduates, in which there appears to be continued

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growth in both categories, younger segments of the population demonstrate higher percentages in both levels of education attainment than older citizens of the region (Shaw, DeYoung, & Rademacher, 2004). Conversely, though both criteria show gains, high school and college degree acquisition continues to lag behind the national average.

In reviewing recent state and national assessment scores, most Kentucky schools and districts in Appalachia continue to demonstrate performance which is below state and national averages (Kentucky Department of Education, 2011d) Results from the 2011 EXPLORE assessment of eighth grade students indicated that only 44 percent of Kentucky's 135 Appalachian middle schools met or exceeded state and national averages. Appalachian sophomores' performance on the PLAN during the same year demonstrated lower performance, with over 65 percent of high schools falling below the state average and only seven of the 87 Appalachian high schools performing above the national average. Appalachian juniors' ACT scores were even lower with only 20 of the high schools' composite scores from the region meeting or surpassing the state average of 18.8, and of those, only one high school scored above the national average (Kentucky Department of Education, 2011b).

As Kentucky schools begin implementing a new series of curricular and assessment formats arising from recent state legislation and federal initiatives like No Child Left Behind (2001) and Race to the Top, the Appalachian area of the state continues to find itself starting from a point of economic and scholastic disadvantage. Some of these limiting factors are longstanding and deeply embedded in the history and culture of the region, whereas other elements are more recent in their influence on the area (Eller, 2008). Regardless, Kentucky public school educators are likely to find that

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the expectations of higher student achievement, increased graduation rates and successful integration into contemporary post-secondary opportunities will bring increased scrutiny and possible state interventions outlined in Senate Bill 1 (Act Relating to Student Assessment, 2009). School principals in Appalachia are being charged with a slightly more daunting task as they seek to accelerate student improvement within their schools while overcoming external conditions that have historically inhibited achievement.

Leadership Influence on Student Achievement

Kentucky's legislative mandates established through Senate Bill I recognize the importance of effective leadership in raising student academic performance (Act Relating to Student Assessment, 2009). Failure of Kentucky principals to significantly increase student performance on state and national assessments, raise graduation rates, and demonstrate successful transition of graduates to workplace and post-secondary education placements could result in their removal from school leadership positions.

Obviously, principals cannot directly impact every individual student's learning through their own personal classroom instructional engagement. School leaders' impact on student achievement takes more indirect forms of influence (Bossert, Dwyer, Rowan & Lee, 1982; Hallinger, 2011; Hallinger, Bickman, & Davis, 1996; Hallinger & Heck, 1998; Leithwood, Patten, & Jantzi, 2010; Louis, Leithwood, Wahlstrom, & Anderson, 2010; Robinson, Lloyd, & Rowe, 2008). Just as a teacher oversees the conditions of his or her classroom, a principal manages a variety of cultural, operational and situational conditions within the school that can foster or harm the learning environment. As Bossert, Dwyer, Rowan and Lee (1982) indicated, each school presents different organizational elements and school climate conditions that a principal must recognize and

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potentially influence in order to support teacher instruction and student learning. (See Figure 2.2) By fostering an understanding of the unique conditions that exist within a school, identifying interventions which align with school improvement goals and managing the school's resources and stakeholders, principals can influence student achievement (Fullan, 2006; Marks & Printy, 2003; Robinson, Lloyd, & Rowe, 2008; Spillane 2006; Witziers, Bosker, & Kruger, 2003). Principals of Appalachian schools must recognize these conditions which are socially, instructionally, financially and even communally unique for the students and staff who they oversee in order to identify interventions that will be most applicable in increasing student performance.

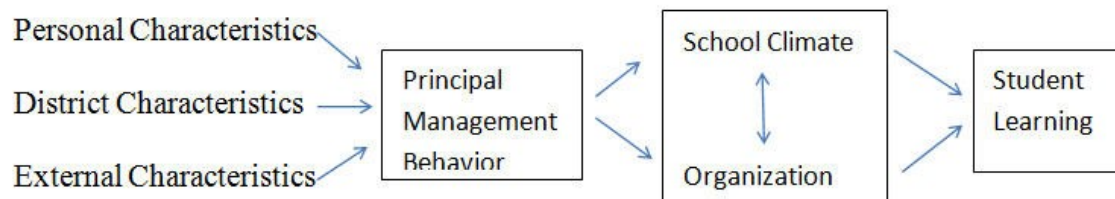


Figure 2.2. Bossert et al. Framework for Examining Instructional Management

Source: Bossert, S., Dwyer, D., Rowan, B., & Lee, G. (1982). The instructional management role of the principal. *Educational Administration Quarterly*, 18(3), 34-64.

Research indicates that effective school leadership effects student achievement albeit indirectly. Similarly, Hallinger and Heck (1996, 1998, 2009) identify through quantitative research that though it is difficult to demonstrate principals' direct effect on student achievement, school leaders' behaviors can be identified and measured so as to evaluate the indirect influence on pupil performance by those leaders' actions. Through positive distributing leadership in school goal setting, recognizing organizational culture,

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cultivating social networks, maintaining orderly and equitable school environments, and imparting a shared vision and values to stakeholders, a school leader can influence student outcomes and explain as much as five percent of variance in student achievement. (See Figure 2.3) Additionally, Hallinger and Heck (1996, 2009) note that personal and contextual conditions of the school have a reciprocal influence on principal leadership.

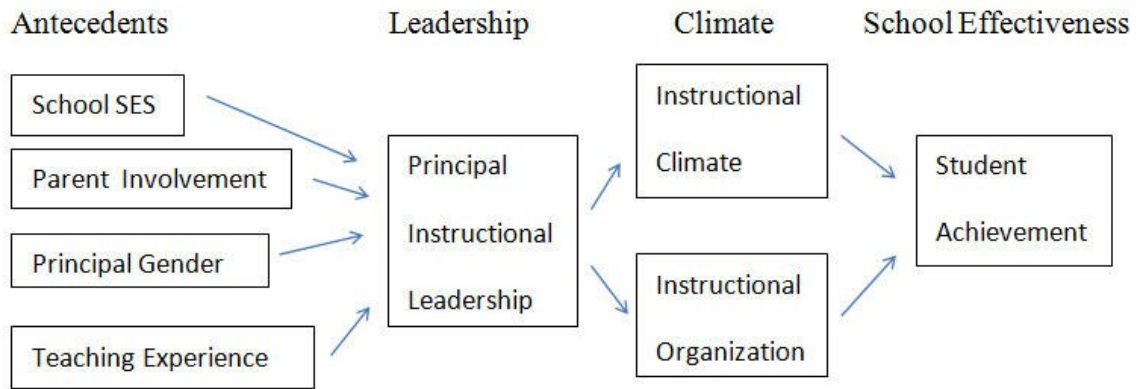


Figure 2.3. Hallinger's Basic Model of Principal Effects on Achievement

Source: Hallinger, P., Bickman, L., & Davis, K. (1996). School context, principal leadership, and student reading achievement. *The Elementary School Journal*, 96(5), 527-549.

Effective principals engage in four practices according to Leithwood, Day, Sammons, Hopkins and Harris (2006) in order to facilitate their school's success: management of instruction, development of staff, establishing direction and reshaping the organization (Leithwood & Riehl, 2005; Leithwood, Day, Sammons, Hopkins, & Harris., 2006). In the 2004 Wallace Foundation report addressing leadership influences on student learning, school leadership was identified as being second only to classroom instruction as contributing to student learning (Leithwood, Louis, Anderson, & Wahlstrom, 2004). Specifically, the report recognizes that school leaders must work to channel a variety of

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influences and expectations in order to effectively support learning. (See Figure 2.4) Leithwood and his colleagues (2005, 2006) go on to point out that leadership has the greatest potential for influencing schools which are experiencing the most difficult conditions in educating students, not unlike those of Appalachia. In light of the significance of leadership in relation to student achievement, the Wallace report emphasizes the need to improve the recruitment, selection, support, evaluation and training of individuals in these instrumental positions of leadership.

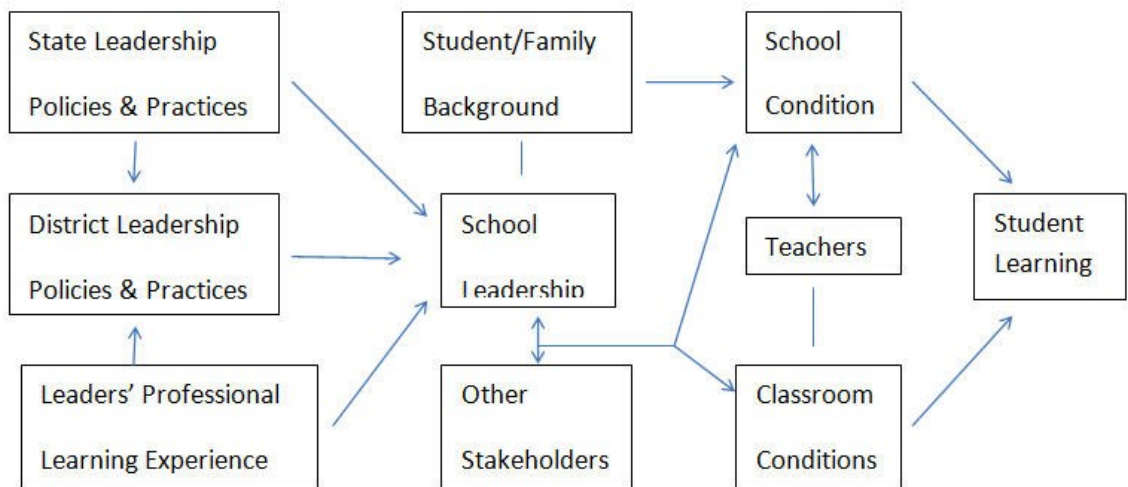


Figure 2.4. 2004 Wallace Foundation's Linking Leadership to Learning

Source: Leithwood, K, Louis, K., Anderson, S., & Wahlstrom, K. (2004). How leadership influences student learning. New York: The Wallace Foundation.

Most recently, Leithwood, Patten, and Jantzi (2010) have quantitatively applied a “four path” model as a means of identifying specific principal behaviors that influence student behavior. (See Figure 2.5) These four paths are identified as rational, emotion, family and organizational, with each characterized by two traits. Research results

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indicated that principals who worked with staff to set high academic standards with the belief that students could achieve these goals and maintained collaboratively developed behavior standards but with flexible responses (rational path) influenced student learning. Additionally, school administrators impacted student achievement through supporting teacher efficacy and cultivating trust among teachers, students and parents (emotion path). Principals who embrace collaborative leadership approaches are able to facilitate these two paths most effectively. Interestingly, organizational elements such as efficient use of instructional time and engagement in professional learning communities did not indicate significant influence on student achievement. Finally, the presence of adult support in student homes and access to computers in pupil households characterize the family path. Of these two characteristics, the presence of computers in student homes contributed the greatest to student achievement. (Leithwood, Patten, and Jantzi, 2010). As will be discussed in the next section, the influence of the family path on achievement was significant.

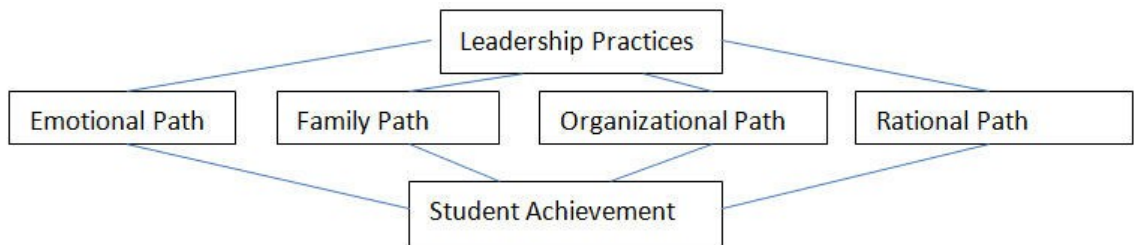


Figure 2.5. The Four Paths: Influences on School Leadership

Source: Leithwood, K., Patten, S., & Jantzi, D. (2010). Testing a conception of how school leadership influences student learning. *Educational Administration Quarterly*, 46(5), 671-706.

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Leadership and Culture

As identified by these researchers and in support of state legislative school performance expectations such as those in Senate Bill 1, school leaders continue to seek means of creating school environments and cultures that support and sustain academic success. In order to accomplish this, there is no singular path or policy which all principals might invoke, but as Marzano, Waters, and McNulty (2005) point out, they should seek to foster a variety of skills and dispositions which interrelate and complement one another. This model identifies 21 leadership behaviors and characteristics that impact student achievement. (See Table 2.1) Behaviors that support viable curricula with challenging goals, ensure a secure and orderly environment, encourage parent involvement, and support collegial relationships with staff are considered essential priorities for a principal in order to ensure effective leadership and support student achievement (Marzano, Walters, & McNulty, 2005).

Table 2.1

Marzano, Walters, & McNulty's 21 Responsibilities of the School Leader

Focus	Resources	Communication	Monitoring/Evaluation
Input	Visibility	Change Agent	Situational Awareness
Order	Discipline	Relationships	Intellectual Stimulation
Optimizer	Flexibility	Ideals/Beliefs	Instructional Involvement
Outreach Culture	Affirmation	Contingent Rewards	Instructional Knowledge
Culture			

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Source: Marzano, R., Waters, T., & McNulty, B. (2005). *School leadership that works: From research to results*. Alexandria, VA: Association of Supervision and Curriculum Development.

Just as principals seek to influence internal school culture through cultivating supportive and collegial relationships with teachers, ensure needed resources are available, develop a shared vision for the school and endorse high behavioral and academic expectations that all students can attain, they should also be aware of local social and cultural forces which impact learning beyond the school walls. Leithwood, Patten and Jantzi (2010) point out that the family path that is categorized as the human and material support a student's family is able to provide, is more influential on student achievement than the organizational path that includes instructional use of class time and utilization of professional learning communities by educators. This indicates that school leaders' behaviors and decisions are also influenced by external factors such as students' socioeconomic status, parent expectations and community type.

Principals should take into account these family elements and seek out ways of recognizing and mitigating these influences through their own interactions and interventions in order to optimize their impact on student achievement (Hallinger & Murphy, 1986). Educational leaders who recognize that some cultures and familial systems place lesser value on individual academic achievement should seek out interventions which merge accepted cultural behaviors with those that also support student success as a byproduct. According to Hallinger and Leithwood (1998), "The meaning associated with an assessment of a principal's impact on student achievement is lessened when we find that this represents a less significant goal within the culture" (p.

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147). Recognizing and adjusting to social contexts are particularly significant when addressing student achievement in Appalachian schools, especially if a principal is not a native of the region. Furthermore, Semke and Sheridan (2011) point out the social context “is a significant factor in understanding academic achievement and the setting in which a child, family, and school is situated is among the salient contexts influencing performance” (p. 3). Given the unique characteristics of Appalachia, such understanding by principals is critical.

Ellis (2011), Eller (2008) and Caudill (1963) note that the Appalachian region’s people have traditionally placed a limited value on education beyond basic skills and perhaps possess defensive perspectives of those elements that are alien to their native customs and values. Concepts like large scale institutional services, object based commercialism, competitive individualism, and independence from family may be prohibiting perceptions to school level achievement.

As significant as social context is in influencing school leadership approaches (Hallinger & Leithwood, 1998), principals should be wary of existing conditions as a basis for biased acceptance of the educational status quo. As Valencia (1997) points out, deficit theory justifies academic shortcoming and failure to align one’s values with middle-class expectations based upon a perception that students and their families possess inferior qualities. To some, these characteristics might be embodied in non-standard language skills, disinterest in traditional learning modes, and the appearance of limited intellectual capacity. Educators who subscribe to deficit theory, instead of valuing the cultural differences and behaviors of students in the context of their familial, class

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and economic environment, instead attribute student lack of engagement as indifference, defiance or perhaps even genetics (Valencia, 1997).

Equally important is the perception which students and families develop among themselves as a result of their interactions with mainstream cultural influence beyond their rural environment. Theobald and Wood (2010) point out that these external messages from “dominant culture” influence how people from rural environments may perceive themselves through imposed stereotypes of inferiority or backwardness. Regrettably, these misperceptions about rural Appalachia have been reinforced through years of negative portrayals by mass media and pop culture (Heilman, 2004; Sizemore, 2005). These negative impressions have become engrained over a number of decades and will no doubt take many years to overcome. Overtime, however, these barriers can be broken down by Appalachian educational and community stakeholders.

In many ways, educators and school leaders serve as facilitators of transition between the established culture of Appalachia and that of the larger nation and beyond (DeYoung, 1995; Schwarzeller & Brown, 1962). This role is one that can serve to balance the practices and knowledge that are applicable beyond the isolation of the mountains and hollows, while understanding and accepting the culture and values of Appalachian students and families. With the exception of the recent integration of internet technology, schools serve as the most significant cultural bridge between Appalachia and the world beyond (DeYoung, 1995). Public schools in Appalachia serve not just as a means of expanding understanding beyond the parameters of the local culture but also as a means of preparing students for opportunities that exist well beyond their isolated communities. This presents school leaders with both an opportunity through

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knowledge and skill development, as well as reluctance among some students and their families that perceive the goals of education as threatening in terms of their values and existing conditions. Paradoxically, it is likely that most principals probably view high student achievement as a means of expanding students' career opportunities and enriching their material existence, while native Appalachians may sense concern about the exodus of young people from the region and the indoctrination of students to beliefs and values of a national existence that they find alien and perhaps even threatening.

There is little doubt that state and national leaders will continue to push schools for higher student achievement through various reform mandates and initiatives. With small rural Appalachian school districts more dependent upon funding beyond their limited local tax base and with the regulatory emphasis for accountability being placed heavily on student performance on standardized assessments, school principals in Kentucky's Appalachian region are presented with the challenge of sustaining student achievement or risking state intervention, reduction of funding, or perhaps even the loss of their own job. Interventions would best seem accomplished through an eclectic application of effective school leadership skills that interphase efficient operational use of resources, collegial and supportive relationships with stakeholders, and a sensitivity to the Appalachian culture and conditions in which the school exists.

CHAPTER 3: METHODS

Background of Study

Just as the Appalachian region of eastern Kentucky served as an early geographic boundary between colonial America and the western frontier, it still maintains a point of contemporary demarcation today between the mainstream middle class perceptions and the unique culture which identifies this region and its people (Eller, 2008). The Appalachian area of the Commonwealth is recognized for both its natural beauty as well as the substandard socioeconomic conditions in which its citizens live. Similar to the Cumberland Gap's historical role as a passage between the east and the frontier over 200 years ago, Appalachian schools currently offer a similar bridge between the isolated rural traditions coupled with stagnant economic conditions of the region and the more diverse perspectives and opportunities which exist beyond the mountainous region.

The majority of Kentucky Appalachian high schools have historically scored lower than average on national assessments (DeYoung, 1983; Eller, 2008; Ford, 1962; KDE, 2011a; KDE, 2011b; KDE, 2011d). Through the last half of the twentieth century most of the region's smaller local schools consolidated into larger centralized facilities which often served the entire county (Ellis, 2011). This consolidation came with decreased local control with greater regulation and accountability to state and local officials, which supplied both financial support as well as instructional and assessment criteria. Student achievement through standardized assessment instruments based on national performance standards as well as educator effectiveness expectations grew with this call for accountability. Kentucky Department of Education initiatives developed in response to Senate Bill 1 not only call for greater workforce and college readiness levels

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among high school students but also outline interventions which can be undertaken by the state when these performance standards are not being met, including the removal of school council members, educators and principals from poorly performing schools (Act Relating to Student Assessment, 2009).

Research Questions

The following questions were addressed in this research study:

- 1) What is the relationship between teacher ratings of principal leadership as identified through the 2011 TELL survey and student achievement on the ACT examination in Kentucky Appalachian high schools?
- 2) What is the relationship between teacher ratings of principal leadership as identified through the TELL survey and student performance between gains from 2010 Sophomore PLAN school composite scores to the 2011 Junior ACT school composite scores?
- 3) What is the relationship between teacher ratings of principal leadership in the areas of cultural, operational and instructional leadership as identified by the 2011 TELL survey and student achievement on the ACT school composite score in Kentucky Appalachian high schools?
- 4) What is the relationship between per pupil expenditure, teacher education level, free/reduced lunch eligibility, student enrollment, and principal leadership as identified by the 2011 TELL survey with student achievement on PLAN and ACT examinations for Kentucky Appalachian high school students?

Several null hypotheses from these questions emerged:

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- 1) There is no relationship between teacher ratings of principal leadership on the TELL survey and student achievement on the ACT examination of Kentucky Appalachian high schools.
- 2) There is no relationship between principal leadership on the TELL survey and student performance gains between 2010 Sophomore PLAN school composite scores and 2011 Junior ACT school composite scores.
- 3) There is no relationship between teacher ratings of principal leadership in the areas of cultural, operational and instructional leadership as identified by the 2011 TELL survey and student achievement on the ACT examination in Kentucky Appalachian high schools.
- 4) There is no relationship between per pupil expenditure, teacher education level, free/ reduced lunch eligibility, student enrollment, and principal leadership on the TELL survey with student achievement on PLAN and ACT examinations for Kentucky Appalachian high school students.

Research Design

This quantitative research study utilized a correlational research design. The dependent variables are the 2011 mean composite ACT score calculated for each school, as well as the gain in student performance on 2010 PLAN school scores to 2011 ACT school scores. Individual Appalachian high school principals' behaviors associated with school operations, instruction and culture are harvested from the Kentucky Department of Education's TELL (Teaching, Empowering, Leading and Learning) survey. This survey was administered on-line to all Kentucky teachers during the spring of 2011. This study sought to determine if specific leadership behaviors as identified and evaluated by

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teachers on the TELL survey predict student performance on the 2011 ACT examination or gains in student performance from 2010 PLAN to the 2011 ACT.

Variables and Measures

KRS 158.6451 requires all eleventh grade Kentucky students to take the ACT exam at the state's expense as part of the state's assessment and accountability plan. Additionally, all tenth grade students are required to take the PLAN examination. Students' scores are to be included on individuals' transcripts as well as pupil performance reports provided to the students' families. For the purposes of this study, the dependent variables representing student academic achievement are 1) the school's average composite score for all juniors who took the state administered ACT examination during the spring of 2011, and 2) the average gain score calculated as the mean 2011 ACT score minus the mean 2010 PLAN score at the school.

The ACT exam assesses students in the areas of English, science, reading and mathematics based upon a scale score of 1 to 36, as well as calculates a composite score which is the average of all four assessment areas for an individual student (ACT, 2013). The ACT composite score for a school site is determined by averaging all student composite results for a specific school during the annual state administration of the exam. Similarly, the PLAN assessment is administered to Kentucky Sophomores by the state and assesses students in the same areas as the ACT exam. Based on a scale score of 1 to 32 students receive scores in English, science, reading and mathematics, as well as a composite score. PLAN is marketed by ACT as a companion instrument to the ACT exam, with both serving as predictors for college and career readiness.

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The Teaching, Empowering, Leading and Learning (TELL) Kentucky survey of school working conditions was administered to teachers across the state in the spring of 2011 by the Kentucky Department of Education (Kentucky Department of Education, 2011i). According to a Kentucky Department Education News release,

The purpose of the survey is to document and analyze how teachers and other educators view their teaching and learning conditions, so that educators, stakeholders and policymakers can make evidence-based decisions on policies and practices that will improve student achievement and teacher retention.

(Kentucky Department of Education, 2011i)

The electronic survey presents teachers with 24 questions that solicit 134 responses from each participant. These questions address: (1) use of time; (2) facilities and resources; (3) community involvement; (4) student management; (5) teacher leadership; (6) school leadership; (7) professional development; (8) instructional practices and support; and (9) overall impression. There is an additional survey component for new teacher interns, but this section is not used in this study.

The leadership independent variables for the research question arise from the teacher responses to TELL survey statements associated with principal leadership. The items are used to identify positive leadership overall, and in three specific dimensions; operational, instructional and cultural leadership. The TELL items utilize a 4-point Likert scale with possible responses from teachers being: strongly disagree, disagree, agree or strongly agree. Teacher responses to individual questions represent the percentage of selections for each of these four possible responses at the school level. Weighted scores are created for each of the four response categories by using a percentage multiplier of

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four for “strongly agree,” a multiplier of three for “agree,” a multiplier of two for “disagree” and no weighted score for responses of “strongly disagree.”

Teacher responses to 15 of the TELL survey questions addressing principal leadership as a whole are used in this study. As noted above, these 15 items are subdivided by the researcher based upon each statement’s alignment with the principals’ ability to influence three areas: school culture, school operations or school instruction. The following four TELL survey statements are categorized as cultural because they primarily focused on stakeholder relationships and their influence on the schools atmosphere:

- The faculty and leadership have a shared vision.
- There is an atmosphere of trust and mutual respect in this school.
- Teachers feel comfortable raising concerns that are important to them.
- The faculty are recognized for accomplishments.

The following five TELL survey statements are categorized as operational because their main focus is management of student behavior and teacher job performance:

- School administrators consistently enforce rules for student conduct.
- School administrators support teachers’ efforts to maintain discipline in classroom.
- The school leadership consistently supports teachers.
- Teacher performance is assessed objectively.
- The procedures for teacher evaluation are consistent.

The final six TELL survey statements used in this study are categorized as instructional because they are primarily rooted in student learning and instructional delivery:

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- Teachers are held to high professional standards for delivering instruction.
- The school leadership facilitates using data to improve student learning.
- Teachers receive feedback that can help them improve instruction.
- Teachers are encouraged to try new things to improve instruction.
- Teachers are assigned classes that maximize the likelihood of success with students.
- Teachers have autonomy to make decisions about instructional delivery.

Cronbach’s alphas were run to determine the reliabilities of these four measures of leadership: overall leadership, cultural, operational and instructional. Tables 3.1, 3.2, and 3.3 show high internal consistency among the statements grouped into the three leadership categories with reliability coefficients in excess of .9 in each instance.

Table 3.1

Cultural Scale Reliability

Cronbach's Alpha	N of Items		
.956	4		
Item Statistics			
	Mean	Std. Deviation	N
The faculty and leadership have a shared vision.	2.80	.32	64
There is an atmosphere of trust and mutual respect in this school.	2.64	.37	64
Teachers feel comfortable raising concerns that are important to them.	2.65	.34	64
The faculty are recognized for accomplishments.	2.72	.33	64

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Table 3.2

Operational Scale Reliability

Cronbach's Alpha	N of Items		
.954	5		
Item Statistics			
	Mean	Std. Deviation	N
School administrators consistently enforce rules for student conduct.	2.70	.42	64
School administrators support teachers' efforts to maintain discipline in the classroom.	2.96	.41	64
The school leadership consistently supports teachers.	2.82	.37	64
Teacher performance is assessed objectively.	3.02	.24	64
The procedures for teacher evaluation are consistent.	3.03	.25	64

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Table 3.3

Instructional Scale Reliability

Cronbach's Alpha	N of Items		
.906	6		
Item Statistics			
	Mean	Std. Deviation	N
Teachers are held to high professional standards for delivering instruction.	3.13	.257	64
The school leadership facilitates using data to improve student learning.	3.18	.25	64
Teachers receive feedback that can help them improve teaching.	2.93	.28	64
Teachers are encouraged to try new things to improve instruction.	3.08	.21	64
Teachers are assigned classes that maximize their likelihood of success with students.	2.67	.26	64
Teachers have autonomy to make decisions about instructional delivery (i.e. pacing, materials and pedagogy).	2.93	.25	64

The additional predictor variables of school per pupil expenditure, faculty educational levels, school enrollment and the percentage of students receiving free and reduced lunch services were selected to represent school context since previous research indicates that school characteristics influence the relationship between principal effectiveness and student achievement (Hallinger, 2011; Hallinger, Bickman, & Davis, 1996; Hallinger & Heck, 1998; Leithwood, Patten, & Jantzi, 2010; Louis, Leithwood, Wahlstrom, & Anderson, 2010). This information on school characteristics was

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harvested from the Kentucky Department of Education school reporting data for 2011. In addition to total school enrollment, each school characteristic was selected to provide a different area of influence in the study. Free and reduced lunch percentages represent the socioeconomic composition of the student body. The identification of Rank I prevalence among faculty within a school serve as a means of identifying the possible depth of intellectual and human resources within a school. Finally, per pupil expenditures provides a measure of the potential for available resources in support of student instruction.

Teachers' online responses were collected anonymously during the survey window of March 1-25, 2011 and made public the following academic year (TELL Kentucky, 2011). Collective faculty responses for each question were tabulated by New Teacher Center for each school that reached at least a 50 percent participation rate among its faculty with a minimum of five educator respondents for a specific facility.

Sample

For this study, only teacher responses from secondary schools located in Appalachian counties of Kentucky are reviewed. As identified by the Appalachian Regional Commission, these counties included: Adair, Bath, Bell, Boyd, Breathitt, Carter, Casey, Clark, Clay, Clinton, Cumberland, Edmonson, Elliott, Estill, Fleming, Floyd, Garrard, Green, Greenup, Harlan, Hart, Jackson, Johnson, Knott, Knox, Laurel, Lawrence, Lee, Leslie, Letcher, Lewis, Lincoln, McCreary, Madison, Magoffin, Martin, Menifee, Metcalf, Monroe, Montgomery, Morgan, Nicholas, Owsley, Perry, Pike, Powell, Pulaski, Robertson, Rockcastle, Rowan, Russell, Wayne, Whitley and Wolfe. (See Figure 3.1)

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Figure 3.1. Appalachian Counties of Kentucky

Source: Mountain Association for Community Economic Development. (2011).
MACED Service Region Map. Retrieved from
<http://www.maced.org/counties.htm>

Within this region of 54 counties, there are 87 public high schools. As outlined in the TELL survey reporting parameters, 13 of these high schools in the region do not offer data as a result of a faculty response rate of less than 50 percent and cannot be included in this study. Additionally, if there was a change in principals between the academic year of 2010 and 2011, those schools were also excluded from the final sample. The rationale for excluding the schools that experienced principal turnover between 2010 - 2011 (year ACT scores are harvested and TELL survey administered) and the preceding 2009-2010 year was to ensure that principal leadership is consistently from the same individual, as well as to provide at least a two year period in which the principal could influence high school student achievement. This change in leadership condition accounted for an additional 10 high schools not being included in this study. (See Table 3.4)

The remaining 64 Appalachian high schools used for this research ranged in enrollment from 120 to 1323 students with an average of 623 pupils. The percentage of

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students who qualified for free and reduced lunch was 61 percent and of the total 43,200 students enrolled in these Appalachian high schools, three percent were racial/ethnic minorities.

Table 3.4

Kentucky Appalachian High School Sample (n = 64)

High School Category	Sample Size
Schools in Appalachian region	87
Schools with less than 50 percent participation	13
Schools with principal change	10
Study sample size	64

Source: TELL Kentucky. (2011). TELL Kentucky: Teaching, empowering, leading and learning. <http://www.tellkentucky.org/>

Data Analyses

IBM SPSS Statistics program, version 19.0 was used to analyze data for this study. Descriptive statistics were calculated including the means and standard deviation of student ACT scores, free and reduced lunch eligibility, teacher education level, school enrollment, per pupil spending and teacher TELL survey leadership statement responses. Paired sample t-test are utilized to compare the means of each of the three categories of leadership (cultural, operational, instructional) within the TELL survey. Bivariant correlations are run to assess the relationship of these measures of leadership with student achievement. Finally, simple linear regressions are employed to determine if teacher education level, leadership, school enrollment, student eligibility for free and reduced lunch and per pupil expenditures predict student achievement.

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Limitations of the Study

One limitation of the study lies in the lack of representation for 15 percent of Kentucky's Appalachian high schools in the TELL survey. This is specifically due to faculty survey participation at 13 of these high schools being less than 50 percent. As this is the first electronic administration of this statewide survey, the low response may be due to a lack of understanding about the survey on the part of teachers or limited effectiveness in communication regarding the survey's implementation and use. It might also indicate the reluctance of teachers to participate due to fear of lack of anonymity, concern over possible negative internal or external consequences resulting from survey results, or a professional atmosphere of indifference. If any of these conditions did influence faculty members not to participate in the survey, it may indicate that teacher responses to cultural, operational or instructional measures of principal effectiveness may have resulted in higher scores in those leadership areas than actually exist among all faculty within a school, district, region or the state.

Another limitation is the study's time frame that utilizes ACT scores from only the 2011 academic year, as well as a one year comparison of PLAN/ACT gains. Students participating in the ACT and PLAN examination for any given academic year collectively bring a variety of intellectual, experiential and even numerical differences which can collectively impact a school's ACT or PLAN composite score. Equally, using the school's homogenized ACT or PLAN composite score of all enrolled students within a single grade level as the sole measurement for identifying academic achievement is particularly narrow in determining if an entire school is academically achieving. Similarly, growth in student performance from the 2010 PLAN to the 2011 ACT only

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provide a one year frame to draw comparisons and does not guarantee that student membership is the same for each examination.

Additional factors which must be considered are the sources and focus of leadership influence. School leadership can expand beyond the role of the principal to include assistant principals, guidance counselors, team leaders, curriculum coaches and other staff members who can impact student achievement and school operations. As a result, teachers' responses to TELL survey statements may not be exclusive to principal behaviors only. Some of the TELL survey statements used in this study ask teachers to make determinations based on their perceptions about "school leadership" (TELL Kentucky, 2011) and not specifically the principal of their respective school. In the same token, most of the schools' enrollment sizes in this study would reflect limited membership in what one might consider a leadership team for a school. Moreover, there is a separate section on the survey that assesses teacher leadership specifically. In the end, principals' roles and duties in the context of these Kentucky Appalachian high schools consistently reflect an operational hierarchy where principals possess exclusive oversight and responsibility of all faculty, staff and students.

Effective leadership practices employed by the principal may not result in a uniform focus or effect on all elements of student achievement every day, semester or academic year. A principal could potentially be scored very high on the survey by the school's teachers, yet his or her efforts and initiatives may not have directly impacted student performance on the PLAN or ACT assessments.

Finally, the data utilized in this study are school level data, which has two potentially negative consequences. First, school means may mask high and low student

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achievement, as well as unfavorable or favorable ratings of principal leadership. Second, the final data included only 64 schools, thereby limiting generalizability and the statistical power to find differences in variables that may exist.

CHAPTER 4: RESULTS

Context Analysis

The purpose of this study was to determine if a relationship exists between Appalachian high school juniors' performance on state administered ACT exams and principal leadership ratings as identified by teachers through the 2011 TELL survey. This study also sought to determine if principal effectiveness in the areas of cultural, operational and instructional leadership as identified through the 2011 TELL survey influences student achievement on the ACT and on student achievement growth between the 2010 PLAN and 2011 ACT assessments. Finally, this study examined the relationship between per pupil expenditure, teacher education, school enrollment, free/reduced lunch eligibility of Kentucky Appalachian high schools and principal leadership with student achievement. Principal leadership data were collected from the 2011 TELL survey utilizing 15 statements addressing operational, cultural and instructional leadership. 2010 PLAN and 2011 ACT school composite scores, per pupil expenditures levels, school enrollment teacher education levels and free/reduced lunch eligibility rates for Appalachian high schools (n=64) were harvested from the Kentucky Department of Education.

Descriptive Statistics for Appalachian Schools

Of the Appalachian high schools (n=64) in this study enrollment ranged from 120 students to 1323 with a mean enrollment of 623 ($M = 62$, $SD = 282.35$) and mean minority population of slightly more than 3 percent ($M = 3.21$, $SD = 2.85$). Free and reduced lunch eligibility among students attending Appalachian high schools in this study

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ranged between 25 percent and 86percent with a mean of 63 percent (M = 62.77, SD = 12.51) as noted in Table 4.1.

Table 4.1

2011 Appalachian High School Enrollment and Free/Reduced Lunch Rate

	N	Minimum	Maximum	Mean	Std. Deviation
Total Student Enrollment	64	120	1323	623.2	0282.35
Percent Eligible for Free/Reduced Lunch	64	25	86	62.77	12.51
Percentage of Non-White Students	64	.00	13.17	3.21	2.85

Source: Kentucky Department of Education. (2011e). Free and reduced 2010-2011 qualifying data [Data file]. Retrieved from <http://education.ky.gov/federal/SCN/Pages/Qualifying-Data.aspx>

Per pupil expenditures reported by schools to the Kentucky Department of Education presented a wide range among the high schools with minimum of \$3,363 and a maximum per pupil expenditure of \$15,455 (M = 7565.58, SD = 1911.55). Though the state utilizes a specific formula for determining per pupil spending, some higher levels of funding may be attributed to external support through grants or resources provided as a part of state intervention in schools with ongoing low student achievement. (See Table 4.2)

Table 4.2

2011 Appalachian High School Per Pupil Expenditures

	N	Minimum	Maximum	Mean	Std. Deviation
Per Pupil Expenditures	64	3363	15455	7565.58	1911.55

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Source: Kentucky Department of Education. (2011c). District profiles. Retrieved from <http://www.lrc.ky.gov/lrcpubs/RR392.pdf>

During the period of this study, teacher education levels in these Appalachian high schools (N = 64) indicate that faculties seem to be predominately populated with teachers who hold advanced degrees and certifications beyond a bachelor degree. As noted in Table 4.3, the percentage of faculty members within each school holding a master degree ranged from 20 to 70.30 with a mean of 45 percent (M = 45.12, SD = 11.28). Similarly, the percentage of school faculty members who held a Rank I ranged from 13.5 to 69.60 with a mean of almost 41 percent (M = 40.76, SD = 12.19). The average years of experience among these faculties was about 12.5 years (M = 12.64, SD = 1.84).

Table 4.3

Appalachian Teacher Education Levels

	N	Minimum	Maximum	Mean	Std. Deviation
Percent of Teachers with Bachelor Degree	64	.00	27.60	13.54	6.69
Percent of Teachers with a Master Degree	64	20.00	70.30	45.12	11.28
Percent of Teachers with Rank I	64	13.50	69.60	40.76	12.19
Average Years of Teaching Experience	64	8.9	17.6	12.64	1.84

Source: Kentucky Department of Education. (2011c). District profiles. Retrieved from <http://www.lrc.ky.gov/lrcpubs/RR392.pdf>

Appalachian juniors' 2011 ACT scores from high schools included in this study resulted in school composite scores ranging from 16.4 to 20.9 with a mean of almost 18 (M = 17.93, SD = 1.03). As indicated in Table 4.4, when calculating school achievement

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changes based on the 2011 ACT composite school score minus the 2010 PLAN school composite score, scores ranged from reduction of -11.10 to an increase of 4.4 with a mean school composite increase of 1.28 for all high schools in this study (M = 1.28, SD = 1.93).

Table 4.4

Appalachian High School 2011 ACT Scores and Growth from 2010 PLAN

	N	Minimum	Maximum	Mean	Std. Deviation
2011 Mean ACT Composite Score	64	16.4	20.9	17.93	1.03
Achievement Gain: ACT 2011-PLAN 2010	64	-11.10	4.40	1.28	1.93

Sources: Kentucky Department of Education. (2011b). ACT tested juniors: Trends 2007-08 through 2011-12 [Data file]. Retrieved from <http://education.ky.gov/AA/Reports/Pages/ACT-TestedJuniors.aspx>;
 Kentucky Department of Education. (2011d). EXPLORE and PLAN data [Data file]. Retrieved from <http://education.ky.gov/AA/Reports/Pages/EXPLORE-and PLAN-Data.aspx>

Descriptive Statistics of Leadership Items

As part of this investigation regarding the relationship between principal leadership and student achievement on the ACT exam, teacher responses to TELL survey statements regarding school leadership were examined. These 15 statements formed an overall leadership variable and were grouped into three dimensions based upon their

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influence of cultural, instructional and operational elements within the school. Teachers rated each leadership item as “strongly agree,” “agree,” “disagree,” or “strongly disagree.” For the purpose of this study percentage response for each answer were calculated with a weighted multiplier with “strongly agree” receiving 4, “agree” garnering a 3, “disagree” receiving a 2, and “strongly disagree” being given no multiplier. The weighted sum was then used to represent teacher responses for each specific item for each individual school (n = 64).

As presented in Table 4.5, the statements operationalizing cultural leadership presented the greatest range of scores with a minimum of 1.86 to a maximum of 3.45 and the lowest mean (M = 2.70, SD = .32). Instructional leadership garnered the highest mean teacher response of the three groups of leadership categories (M = 2.98, SD = .21). The mean leadership item scores of all 64 Appalachian high schools’ teacher responses ranged from a high of 3.18 (SD = .25) for “leadership facilitates the use of data to improve student learning” to a low of 2.64 (SD = .27) for “there is an atmosphere of trust and mutual respect in this school.” (See Table 4.6)

Table 4.5

TELL Survey Leadership Means

	N	Minimum	Maximum	Mean	Std. Deviation
Leadership	64	2.16	3.51	2.88	.26
Cultural Leadership	64	1.86	3.54	2.70	.32
Operational Leadership	64	2.10	3.53	2.91	.31
Instructional Leadership	64	2.34	3.47	2.98	.21

Item means are ranked in descending order from most to least favorable in Table 4.6.

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Table 4.6

TELL Leadership Item Means

	N	Mean	Std. Deviation
The school leadership facilitates using data to improve student learning.	64	3.18	.25
Teachers are held to high professional standards for delivering instruction.	64	3.13	.26
Teachers are encouraged to try new things to improve instruction.	64	3.08	.21
The procedures for teacher evaluation are consistent.	64	3.03	.25
Teacher performance is assessed objectively.	64	3.02	.24
School administrators support teachers' efforts to maintain discipline in the classroom.	64	2.96	.41

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Table 4.6 (continued)

	N	Mean	Std. Deviation
Teachers receive feedback that can help them improve teaching.	64	2.93	.28
Teachers have autonomy to make decisions about instructional delivery (i.e. pacing, materials and pedagogy).	64	2.93	.25
The school leadership consistently supports teachers.	64	2.82	.37
The faculty and leadership have a shared vision.	64	2.80	.32
The faculty are recognized for accomplishments.	64	2.72	.33
School administrators consistently enforce rules for student conduct.	64	2.70	.42
Teachers are assigned classes that maximize their likelihood of success with students.	64	2.67	.26
Teachers feel comfortable raising concerns that are important to them.	64	2.65	.34
There is an atmosphere of trust and mutual respect in this school.	64	2.64	.37

Of the three leadership domains of cultural, instructional and operational in this study, items associated with cultural leadership resulted in the lowest mean score responses from teachers ranging from 2.82 (SD = .37) to 2.64 (SD = .27). (See Table 4.7) These statements addressed conditions associated with stakeholder relationships and their influence on the schools culture. Additionally, among all 15 TELL leadership statements, none of the cultural statements were ranked among the top one half by teachers.

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Table 4.7

Appalachian High School Teacher TELL Cultural Dimension Item Means

	N	Mean	Std Deviation
The school leadership consistently supports teachers.	64	2.82	.37
The faculty are recognized for accomplishments.	64	2.72	.33
Teachers feel comfortable raising concerns that are important to them.	64	2.65	.34
There is an atmosphere of trust and mutual respect in this school.	64	2.64	.37

TELL leadership statements which focused on management of student behavior and teacher job performance were categorized as operational. As indicated in Table 4.8, item means ranged from 3.03 (SD = .25) for “procedures for teacher evaluation are consistent” to 2.70 (SD = .42) for “administrators consistently enforce rules of student conduct.”

Table 4.8

Appalachian High School Teacher TELL Operational Dimension Item Means

	N	Mean	Std. Deviation
The procedures for teacher evaluation are consistent.	64	3.03	.25
Teacher performance is assessed objectively.	64	3.02	.24
School administrators support teachers’ efforts to maintain discipline in the classroom.	64	2.96	.41
The school leadership consistently supports teachers.	64	2.82	.37
School administrators consistently enforce rules for student conduct.	64	2.70	.42

The leadership area which received the highest means was that of instructional, which constituted statements that most closely aligned with student learning and

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instructional delivery. The mean range for these six statements ranged from 3.18 (SD = .25) for “leadership facilitates using data to improve student learning” to 2.67 (SD = .26) for “teachers are assigned classes that maximize their likelihood of success with students”. (See Table 4.9) Additionally, the first three instructional items ranked highest among all leadership items with five of the instructional categorized statements ranked among the top eight means.

Table 4.9

Appalachian High School Teacher TELL Instructional Dimension Item Means

	N	Mean	Std. Deviation
The school leadership facilitates using data to improve student learning.	64	3.18	.25
Teachers are held to high professional standards for delivering instruction.	64	3.13	.26
Teachers are encouraged to try new things to improve instruction.	64	3.08	.21
Teachers receive feedback that can help them improve teaching.	64	2.93	.28
Teachers have autonomy to make decisions about instructional delivery (i.e. pacing, materials and pedagogy).	64	2.93	.25
Teachers are assigned classes that maximize their likelihood of success with students.	64	2.67	.26

In summary, teacher responses on the TELL survey about school regarding leadership behaviors related to school culture received the lowest mean score (M = 2.70, SD = .32). Conversely, those leadership behaviors which represented instructional leadership received the highest mean responses (M = 2.98, SD = .21).

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Principal Leadership Dimensions

As reported in Table 4.10, paired sample t-tests were employed to compare the means of each of the three dimensions of leadership within the TELL survey.

Table 4.10

Paired Sample t-Tests of Leadership Dimension Means

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Cultural Leadership	2.70	64	.32	.04
	Operational Leadership	2.91	64	.31	.04
Pair 2	Cultural Leadership	2.70	64	.32	.04
	Instructional Leadership	2.98	64	.21	.03
Pair 3	Operational Leadership	2.91	64	.31	.04
	Instructional Leadership	2.98	64	.21	.03

Paired Samples Test

		Paired Differences		
		Mean	Std. Deviation	Std. Error Mean
Pair 1	Cultural Leadership - Operational Leadership	-.20	.16	.02
Pair 2	Cultural Leadership - Instructional Leadership	-.28	.17	.02
Pair 3	Operational Leadership - Instructional Leadership	-.08	.18	.02

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Table 4.10 (continued)

		Paired Differences		
		95 % Confidence Interval of the Difference		
		Lower	Upper	T
Pair 1	Cultural Leadership - Operational Leadership	-.24	-.17	-10.51
Pair 2	Cultural Leadership - Instructional Leadership	-.33	-.24	-13.22
Pair 3	Operational Leadership - Instructional Leadership	-.12	-.03	-3.52

The paired sample t-tests indicate that there are statistically significant differences between cultural and operational leadership ($t = 10.51$, $df = 63$, $p = .000$), cultural and instructional leadership ($t = 13.22$, $df = 63$, $p = .000$) and operational and instructional leadership ($t = 3.52$, $df = 63$, and $P = .001$). Specifically, the mean of instructional leadership ($M = 2.91$) was greater than the mean for operational leadership ($M = 2.90$). Means for both of these dimensions were greater than the mean for cultural leadership ($M = 2.70$)

Correlations among the three leadership dimensions and overall leadership are presented in Table 4.11. The correlations indicate there are strong positive relationships among all three leadership areas as well as total leadership. The correlations range between .96 and .83 with $p = .000$ in each case.

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Table 4.11

Leadership Correlations

		Leadership	Cultural Leadership	Operational Leadership	Instructional Leadership
Leadership	Pearson Correlation	1	.96*	.96**	.94*
	Sig. (2-tailed)		.000	.000	.000
	N	64	64	64	64
Cultural Leadership	Pearson Correlation	.96*	1	.88**	.88*
	Sig. (2-tailed)	.000		.000	.000
	N	64	64	64	64
Operational Leadership	Pearson Correlation	.96*	.88*	1	.83*
	Sig. (2-tailed)	.000	.000		.000
	N	64	64	64	64
Instructional Leadership	Pearson Correlation	.94*	.88*	.83*	1
	Sig. (2-tailed)	.000	.000	.000	
	N	64	64	64	64

*Correlation is significant at the 0.01 level (2-tailed).

Leadership Behaviors and Student Achievement

Two simple linear regressions were run to identify the extent for which cultural, operational and instructional leadership behaviors predict student achievement. The dependent variable in the first regression was mean ACT school composite scores. The dependent variable in the second regression was the gain score from the 2010 PLAN to the 2011 ACT. As presented in Tables 4.12 and 4.13, in each case, the model was insignificant. In other words, the three regressions of leadership did not predict student

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achievement on the ACT [$F(64) = .82, p = .49$] or gains from the PLAN to the ACT [$F(64) = .40, p = .75$].

Table 4.12

Regression of Three Dimensions of Leadership on Mean ACT School Composite Scores

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.198 ^a	.04	-.01	1.04

Note. a) Predictors: (Constant), Instructional Leadership, Operational Leadership, Cultural Leadership

ANOVA ^b						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.65	3	.88	.82	.49 ^a
	Residual	64.60	60	1.08		
	Total	67.25	63			

Note. a) Predictors: (Constant), Instructional Leadership, Operational Leadership, Cultural Leadership. b)

Dependent Variable: 2011 Mean ACT Composite Score

Table 4.13

Regression of Three Dimensions of Leadership on Mean PLAN/ACT Gains

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.14a	.02	-.03	1.96

Note. a) Predictors: (Constant), Instructional Leadership, Operational Leadership, Cultural Leadership

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Table 4.13 (continued)

ANOVA ^b						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.63	3	1.54	.401	.75 ^a
	Residual	230.75	60	3.85		
	Total	235.38	63			

Note. a) Predictors: (Constant), Instructional Leadership, Operational Leadership, Cultural Leadership. b)

Dependent Variable: Achievement Gain: ACT 2011-Plan 2010

Further analyses of the relationship between student achievement on single year ACT performance (2011) and PLAN/ACT gains in successive years (2010-2011) with the total leadership variable comprised of all fifteen TELL items survey revealed no correlations. Table 4.14 reports the bivariate correlation between leadership as determined by teacher responses to all 15 TELL survey statements and student achievement on the ACT [$r(64) = .05, p = .69$] and student achievement growth between PLAN and ACT assessments [$r(64) = .13, p = .30$].

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Table 4.14

Correlations of Leadership with ACT Achievement and PLAN/ACT Gains

Correlations		Leadership	2011 Mean ACT Reading Score	Achievement Gain: ACT-Plan 2010
Leadership	Pearson Correlation	1	-.05	.13
	Sig. (2-tailed)		.69	.30
	N	64	64	64
2011 Mean ACT Reading Score	Pearson Correlation	-.05	1	.37**
	Sig. (2-tailed)	.69		.003
	N	64	64	64
Achievement Gain: ACT 2011-Plan 2010	Pearson Correlation	.13	.37**	1
	Sig. (2-tailed)	.30	.003	
	N	64	64	64

Note. **. Correlation is significant at the 0.01 level (2-tailed).

School Related Influences on Student Achievement

When reviewing the correlations between school characteristics of per pupil spending, percentage of teachers with Rank I, school enrollment and the percentage of students eligible for free/reduced lunch, there only significant correlations were a positive relationship between per pupil spending and free and reduced lunch eligibility [$r(64) = .48, p = >.000$] and a negative relationship between student enrollment and per pupil expenditures [$r(64) = -.35, p = >.005$]. (See Table 4.15) Schools with higher percentages of low income students are characterized by higher per pupil expenditures. On the contrary, lower per pupil expenditures occur in larger schools. The later relationship

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likely results from economies of scale, while the former is attributable to federal funds such as Title I that are earmarked for lower income students.

Table 4.15

Correlations Between School Characteristics

		Percent Eligible for Free or Reduced Lunch	Per Pupil Expenditures	Percent of Teachers with Rank I	Total Student Enrollment
Percent Eligible for Free/Reduced Lunch	Pearson Correlation	1	.48*	.235	-.21
	Sig. (2-tailed)		.000	.062	.10
	N	64	64	64	64
Per Pupil Expenditures	Pearson Correlation	.48*	1	-.119	-.35**
	Sig. (2-tailed)	.000		.35	.01
	N	64	64	64	64
Percent of Teachers with Rank I	Pearson Correlation	.24	-.12	1	.13
	Sig. (2-tailed)	.06	.35		.32
	N	64	64	64	64
Total Student Enrollment	Pearson Correlation	-.21	-.35**	.13	1
	Sig. (2-tailed)	.10	.01	.32	
	N	64	64	64	64

Note. * Correlation is significant at the 0.001 level (2-tailed). ** Correlation is significant at the 0.05 level (2-tailed).

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In order to identify the influence of Appalachian high school characteristics and school leadership on student achievement, a two regression analyses were conducted. Predictor variables included school leadership, total enrollment, percent eligible for free/reduced lunch and percent of teachers with Rank I. Per pupil expenditures was not included given its relationship with the other predictors and small sample size of the study. These regressions were calculated with both dependent student achievement variables: 2011 mean ACT composite scores and achievement gain between 2010 PLAN and 2011 ACT student performance.

As indicated in Table 4.16, the first regression was significant [$F(64) = 21.43, p = .000$]. The only significant predictor of mean ACT scores was eligibility for free/reduced lunch (Beta = $-.81, p < .05$). As the percentage of low income students increases, mean composite ACT scores decline. Collectively, the predictors explain 56.8 percent of the variance in school level ACT scores.

Table 4.16

Regression of School Characteristics and Leadership on Mean ACT Composite Scores

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.77 ^a	.60	.57	.68

Note. a) Predictors: (Constant), Leadership, Per Pupil Expenditures, Total Student Enrollment, Percent Eligible for Free/Reduced Lunch.

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Table 4.16 (continued)

Model Summary					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	
1	.77 ^a	.59	.57	.68	

Note. a) Predictors: (Constant), Leadership, Percent Eligible for Free/Reduced Lunch, Total Student Enrollment, Percent of Teachers with Rank I.

ANOVA ^b						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	39.83	4	9.96	21.43	.000 ^a
	Residual	27.42	59	.47		
	Total	67.25	63			

Note. a) Predictors: (Constant), Leadership, Percent Eligible for Free/Reduced Lunch, Total Student Enrollment, Percent of Teachers with Rank I. b) Dependent Variable: 2011 Mean ACT Composite Score.

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	21.53	1.13		19.10	.000
	Total Student Enrollment	.000	.000	-.08	-.95	.35
	Percent Eligible for Free/Reduced Lunch	-.07	.01	-.81	-9.14	.000
	Percent of Teachers with Rank I	.01	.01	.15	1.69	.10
	Leadership	.09	.33	.02	.27	.79

Note. a) Dependent Variable: 2011 Mean ACT Composite Score

Table 4.17, displays the results of the second regression analysis which utilized the same predictors but school composite score gains from the PLAN to the ACT as the

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dependent variable. This model was also significant [$F(64) = 4.31, p = .004$]. As with ACT scores, eligibility for free/reduced lunch (Beta = $-.473, p < .05$) was the only significant predictor of gains between the PLAN and ACT composite scores and was negative. Additionally, school enrollment was approaching significance in explaining PLAN / ACT composite gains (Beta = $-.246, p = .07$) but fell slightly short. Collectively the predictors explained 18.5 percent in student achievement gains.

Table 4.17

Regression of School Characteristics and Leadership on PLAN/ACT Gains

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.48 ^a	.23	.17	1.76

Note. a) Predictors: (Constant), Leadership, Percent Eligible for Free/Reduced Lunch, Total Student Enrollment, Percent of Teachers with Rank I.

ANOVA ^b						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	53.23	4	13.31	4.31	.004 ^a
	Residual	182.15	59	3.09		
	Total	235.38	63			

Note. a) Predictors: (Constant), Leadership, Percent Eligible for Free/Reduced Lunch, Total Student Enrollment, Percent of Teachers with Rank I. b) Dependent Variable: Achievement Gain: ACT 2011/PLAN 2010.

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Table 4.17 (continued)

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	2.96	2.90		1.02	.31
	Total Student Enrollment	-.002	.001	-.22	-1.84	.07
	Percent Eligible for Free/Reduced Lunch	-.08	.02	-.47	-3.88	.000
	Percent of Teachers with Rank I Leadership	.022	.02	.14	1.13	.26
		1.03	.86	.14	1.19	.24

Note. a. Dependent Variable: Achievement Gain: ACT 2011-Plan 2010.

In summary, regressions on both ACT composite scores and PLAN/ACT gain composite scores indicated that the only significant predictor of Appalachian student performance was the percentage of students eligible for free and reduced lunch. School leadership was not a significant predictor of either measure of student achievement.

CHAPTER 5: CONCLUSION AND DISCUSSION

Overview of the Study

The purpose of this quantitative research was to determine if a relationship existed between principal leadership and student achievement in Kentucky Appalachian high schools. Principal leadership was assessed through teacher responses to 15 leadership items on the 2011 TELL survey. In addition to the aggregate leadership variable, these items were divided into three leadership dimensions: cultural, operational and instructional. Appalachian high school student achievement was measured through mean 2011 ACT school composite scores as well as mean growth between the 2010 PLAN and 2011 ACT school composite scale scores. School characteristics that have been shown to influence student performance were also embedded in the analyses and included percentage of students eligible for free and reduced lunch, total school enrollment and percentage of teachers with Rank I level of teacher certification.

The research sample was composed of 64 Appalachian Kentucky high schools which had over 50 percent faculty participation on the 2011 TELL survey and were lead by the same principal during the 2009-2010 and 2010-2011 academic years. The high schools included in this study ranged in enrollment from 120 to 1323 students with an average of 623 pupils. The mean percentage of students who qualified for free and reduced lunch participation was 61 percent, and of the total 43,200 students enrolled in these Appalachian high schools, three percent were identified as racial/ethnic. Per pupil expenditures reported by these Appalachian high schools ranged from \$3,363 to \$15,455 ($M = 7565.58$, $SD = 1911.56$). The composition of the school faculties from the sample schools in the research project presented an average of 12.6 years of experience. Over 45

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percent hold a master degree, and 41 percent achieved Rank I certification. The following sections discuss the results of the study.

Interpretation of Findings Associated with Leadership Dimensions

This study selected 15 leadership items which teachers responded to on the 2011 TELL survey and subdivided them into three dimensions associated with school culture, operation and instruction. The 2011 TELL Survey research brief (TELL Kentucky, 2011) indicated that the items comprising the school leadership variable are internally consistent resulting in high reliability ($\alpha = .946$). The reliability of the three leadership dimensions was high as well. It is important that there were high correlations among the three leadership dimensions, which limited their collective ability to predict student achievement.

Despite the above limitations, after subdividing the 15 items into three different leadership dimensions of operational, instructional and cultural leadership, Kentucky Appalachian principals were scored higher by their teachers on the TELL survey in instructional leadership ($M = 2.98$, $SD = .21$) followed closely by operational leadership ($M = 2.91$, $SD = .31$). On average, teachers rated their principals lower on cultural elements of leadership ($M = 2.70$, $SD = .32$).

Higher mean scores associated with instructional items on the TELL survey might be rooted in the Kentucky Department of Education's emphasis on measurable student performance and instructional leadership's impact on time and material resource allocation toward instruction. TELL instructional statements are focused on the principal enhancing teaching conditions to support student success (e.g., data to improve student learning, high teaching standards and improving instruction). These principal behaviors

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address the core of school accountability through student achievement and their reciprocal scores on state and national assessments. Instructional effectiveness presents a direct relationship with student achievement and culminates in high stakes, publicized student performance data. Much of the Kentucky's Department of Education's resources and initiatives are vested in raising student achievement, and as a result, this places greater emphasis on principals' instructional leadership skills.

One should also consider the leadership coursework that Kentucky school principals receive through post-secondary graduate work. Much of this university course work is aligned with the Interstate School Leadership Licensure Consortium (ISLLC) standards. These standards place primacy on instructional leadership and less emphasis on operational responsibilities of principals. This principal preparation model may result in the placement of principals who are more focused on the aspects of instructional school leadership than they are on operational or cultural leadership.

Similarly, mean leadership scores aligned with school operations emphasize teacher and student behavioral accountability (e.g. teacher performance and evaluation, student discipline and conduct). Teacher evaluation and student conduct rules of behaviors are usually very specific in nature and are applied on a daily basis by school leaders as part of a formalized process. Just as students are made aware of specific rules and behavior expectations, teachers are also presented with practice and evaluation standards which identify performance parameters by which they will be evaluated.

Conversely, statements grouped under cultural leadership emphasized relationships between teachers and principals (e.g., supportive, recognized for accomplishments, mutual respect, trust). These types of criteria are more personal and

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subjective in nature. There does not exist a formalized and measurable implementation or assessment element for this aspect of leadership. Equally, it should be recognized that many high school principals may have expanded school responsibilities compared to their colleagues at the elementary or middle school levels. These duties associated with athletics, post-graduation stakeholders, teenage activities, the judicial system, etc. require greater engagement with tasks and stakeholders beyond the realm of daily classroom teacher relationship cultivation.

It should be noted that the Tell survey item with the lowest mean was the statement that addressed trust: There is an atmosphere of trust and mutual respect in this school. This may reflect the insular nature of Appalachian communities and their reluctance to trust outsiders or those leadership initiatives that may be considered alien or nonaligned with traditional instructional practices..

Finally, in context with cultural leadership, one must consider that the role of principal at times places that individual in a position of maintaining standards and expectations in support of the goals and ideals of the school and district. This can place the principal in an adversarial position in relationship to teacher performance. This situation may be compounded if the principal does not come from Appalachia or is perceived as a cultural outsider. For example, a principal attempting to enhance professional and instructional teacher behaviors may result in push back from those who are behaviorally entrenched or who are not performing at the expected levels. There is no doubt these teachers would score a school leader poorly on the TELL survey statements aligned with the cultural dimension. The same could also hold true if parents and students were presented with a similar stakeholder survey which sought input regarding a

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principal's leadership. There will be those who will feel strongly that the consequences or decisions made by a principal in relationship to student behavior were unjust or biased. Regrettably, the legal expectation of confidentiality in regards to personnel and student records can compound this perception as aggrieved teachers, parents and students can publically voice their perspective to others while the principal must remain muted.

The contrary could also hold true for principals who embrace a status quo or non-confrontational approach toward teacher interactions. For example, school leaders who have been promoted from the teacher ranks might find embracing corrective or critical positions in regard to colleague practices difficult and would shy from less cordial engagements in order to maintain pre-existing amicable relationships. These individuals might be scored high in cultural based statements by teachers even though their behaviors might run counter to effectively and efficiently increasing student achievement. The point is that statements associated with cultural aspects of leading a school are more subjective and conditional in their interpretation than instructional and operational dimensions.

Interpretation of Findings Associated with Leadership and Student Achievement

The primary focus of this research was to determine if a relationship existed between Appalachian teacher ratings of their high school principals' leadership and student achievement as measured through PLAN and ACT school level performance. Through simple regressions, it was determined that, based on teacher responses to leadership statements on the 2011 TELL survey, Appalachian high school principal leadership does not have a statistically significant level of influence on student achievement as identified through student performance on the 2011 ACT [$F(64) = .82, p = .49$]. Equally, this study also indicates that Appalachian high school principal

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leadership as identified through 2011 TELL survey responses does not present a statistically significant level of influence on student growth scores measured between 2010 PLAN school composite scores and 2011 ACT school composite scores [$F(64) = .401, p = .75$].

Admittedly, these results present some superficially surprising and contradictory outcomes in light of the vast amount of literature which recognizes the indirect, positive relationship between effective school leadership and student achievement (Bossert, Dwyer, Rowan & Lee 1992; Hallinger, 2011; Hallinger & Heck, 1998; Leithwood, Patten, & Jantzi, 2010; Louis, Leithwood, Wahlstrom, & Anderson, 2010; Robinson, Lloyd, & Rowe, 2008). It is important to note that these research results should be considered in context of the study's parameters and the practical considerations of day to day school leadership.

One research parameter which must be considered is the time frame of the study. Both student achievement and leadership performance are limited to a two year period. Though this period ensures consistent leadership and provides for a relatively consistent student population for analysis, it only presents a snap shot in relationship to long term student performance trends and developing leadership behaviors and activities. No doubt instructional practices and school conditions prior to these two years play an important and influential role in how these school leaders acted and how students performed on these two individual examinations.

During this research period, individual principals were confronted with a myriad of financial, facilities, parental, security, transportation and other management based situations in which they responded, with many often having limited if any direct context

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to student learning. Of course these types of challenges are unevenly spread among all school principals and a reality of school leadership everywhere. These challenges, however, may be more impactful on principals of Appalachian schools since these schools are often small and employ fewer assistant principals, counselors and other specialists. One should consider that the mean size of these Appalachian high schools was just over 600 pupils ($M = 623.2$, $SD = 282.35$) with an average free and reduced lunch population of 63 percent ($M = 62.77$, $SD = 12.51$). These smaller Appalachian high schools have both limited financial resources and human capital to function under the same operational regulations and performance expectations as all Kentucky Schools. This often requires more effort and time from these Appalachian principals who must assume additional tasks due to smaller instructional/administrative staffs and greater student need.

One should also consider that the instructional, operational and culturally based initiatives on which a principal seeks to focus his or her efforts might have unintended consequences on student achievement as measured through PLAN or ACT examinations. For example, a principal confronted with the first year implementation of a new state assessment component, cultivating greater teacher integration of new technology, undergoing reaccreditation review, adjusting staffing due to a midyear budget cut or confronting a culture of student bullying might not be able to devote as much attention to PLAN or ACT student preparation by his or her faculty. Similarly, each year, Kentucky high school principals are confronted with the expectation of responding to the annual student performance results of Kentucky Performance Rating for Educational Progress (KPREP) as measured through program reviews, on-demand writing, end of course

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exams, graduation rates, performance gaps and student growth scores in addition to performance on national assessments such as the ACT. It is not an uncommon response by many schools to review these various assessment scores and react by realigning resources and instructional priorities in order to address assessment areas identified as requiring the greatest attention as evidenced by the lowest school and student performance scores. As a principal, one should consider where the most progress can harvest the quickest gains in order to demonstrate adequate school growth through the state's KPREP report. For example, a principal might consider spending funds on an art teacher in order to increase arts and humanities program review self-scoring as simpler and more likely to increase one's future KPREP score than hiring an additional English teacher in hopes of providing language arts interventions for at-risk students identified through PLAN performance. With the exception of graduation, high school performance on the ACT has the most direct impact on individual student access to college.

Unfortunately, the pressure to raise annual KPREP school scores, coupled with the different areas of measurement within the system, can result in principals investing their limited resources in areas other than ACT preparation in order to garner growth in school KPREP scores. This focus of leadership on other outcomes could be another factor explaining the inability of leadership to predict ACT scores in this study.

It should also be recognized that a school's ACT composite score is representative of just one group of students' performance on one single day of testing. Many high school students take the ACT multiple times in an effort to raise their scores and often with positive results. Of equal importance, the ACT school composite score, which is being used as the basis for measuring student achievement in this study, is an average of

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all junior students' scores from that school as administered once by the state. The range of student enrollment for Appalachian high schools included in this study was between 120 and 1,323 pupils. Taking so many individual student scores and homogenizing them into one single averaged score for an entire school would seem to present some concerns when trying to draw internal comparisons as well as ones with other schools or with state/national averages. The same conditions should be considered when reviewing growth scores between 2010 PLAN school composite scores and 2011 ACT school composite scores. Finally, juniors represent only one-fourth of students enrolled in high school.

Interpretation of Findings Associated with Appalachian High Schools

Characteristics

In addition to determining if Appalachian school principal leadership influences academic performance and if specific dimensions of leadership have greater impact on high school student achievement, this study also reviewed the influence of three school variables in combination with leadership to determine if these elements predict Appalachian student performance on PLAN and ACT exams. In addition to the influence of school leadership, the school factors considered were school percentage of free and reduced lunch population, total school enrollment and percentage of teachers possessing Rank I within each high school.

Of these variables, only a school's percentage of free and reduced lunch populations presented a statistically significant negative relationship with Appalachian student achievement on the ACT exam, as identified through school composite scores, and growth between 2010 PLAN and 2011 ACT school composite scores. This finding

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about Appalachian high school students is consistent with literature addressing student socioeconomic status and academic performance (Jensen, 2009; Lacour & Tissington, 2011).

Acquisition of Rank I by teachers results from completion of graduate work beyond the master degree toward a planned program as recognized by the Kentucky Educational Professional Standards Board. At the time of the study, these graduate programs were composed of at least 30 hours of course work, and though one may choose advanced studies in a content area, educators often select a path which leads to additional certifications and expanded career opportunities such as library science, counseling, principalship or district level administration. Additionally, acquisition of Rank I by teachers usually results in an annual pay increase in most districts' certified salary schedules. Although the average Appalachian high school in this study averaged 40 percent of the faculty having attained Rank I ($M = 40.76$, $SD = 12.19$) or the equivalent course work of two master degrees, the additional degree may very well have not contributed to any sort of enhanced content knowledge base. Furthermore, acquisition of Rank I may be interpreted as potential unrest or disinterest in teachers who may be completing the associated course work in order to gain certification for non-teaching school positions or simply to slightly increase their annual salary. Secondly, salary increases for Rank I attainment potentially divert additional district funds toward personnel cost which may not result in instructional growth or higher student achievement. In sum, Kentucky teacher acquisition of Rank I education level may not contribute content knowledge or improvement of instructional pedagogy that could enhance preparation for the PLAN, ACT, or any other classroom course of study.

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Total student enrollment did not indicate a statistically significant relationship with student achievement in this study. This may be in part due to the limited sample size but it may also be indicative of the daily responsibility assumed by a principal of a smaller high school. Though a school's enrollment may be small, the range of responsibilities and expectations remains the same as a larger school. The primary difference is that smaller schools have fewer leadership support roles such as assistant principals, curriculum coaches or guidance counselors. As a result, principals of smaller schools often find themselves assuming greater direct responsibility for a wider range of duties which may detract from their instructional leadership goals.

Per pupil expenditure was not included as a predictor variable in the regression because of its relatively high correlations with eligibility and the need to keep to a minimum the number of predictors given the small sample size of the study. However, it is still worthy of discussion. Per pupil expenditures within a school can range significantly depending on a number of factors. Most Kentucky Appalachian counties have significantly higher levels of poverty than state and national averages and lower per capita and household incomes. Per capita income for Kentuckians residing in Appalachian counties is almost \$10,000 below the national average and nearly \$7,000 lower than the state average. Similarly, children who attend Kentucky's Appalachian schools come from households which earn one-third less than the national average and over \$15,000 less than the average Kentucky household. These indicators provide an important context in regard to the community and familial support which can be provided to students in a material sense.

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Interestingly, Appalachian high schools in Kentucky on average spend \$450 more per student in 2011 than the state average of \$7,565. This higher level of funding may be in part due to these schools' student populations qualifying for higher levels of federal title funds and additional state support based upon financial conditions as well as needed educational intervention due to persistently low academic performance. One must also consider that some individual school expenditures may not necessarily be directly focused on classroom student instruction. Principals and school councils are constantly working to balance expenditures on items such as new band instruments, classroom desk replacement or upgraded stage lighting against purchases of student technology, staff professional development or additional staffing for at risk students. Simply comparing levels of expenditures does not mean that a proportional expenditure is being made directly on student instructional support. Though not a factor included in this study, the role of the principal in how financial resources are allocated is obviously a related factor in student achievement.

Overview of Study Questions

Upon reviewing study results, the following three null hypotheses should be accepted:

- 1) There is no relationship between teacher ratings of principal leadership through the TELL survey and student achievement on the ACT examination of Kentucky Appalachian high schools.
- 2) There is no relationship between principal leadership and student performance between 2010 Sophomore PLAN school composite scores and 2011 Junior ACT school composite scores.

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3) There is no relationship between teacher ratings of principals in the areas of cultural, operational and instructional leadership as identified by the 2011 TELL survey and student achievement on the ACT examination in Kentucky Appalachian high schools.

The fourth null hypothesis should be rejected given that school percentage of students eligible for free and reduced lunch had a negative relationship with student achievement school composite scores on the ACT test, as well as achievement gains between 2010 PLAN and 2011 ACT school composite scores.

Implications for Practice and Policy in Appalachia

Lower teacher ratings of Appalachian high school principals on the TELL survey in the area of the cultural domain compared to the instructional and operational domains may indicate the need for increased awareness or training for principals who serve Appalachian schools. New principals who are formerly non Appalachian residents or those who are perceived by locals as cultural outsiders could experience uncertainty or reluctance among Appalachian teachers who they lead. This outsider perception may limit the ability of new principals to cultivate supportive and trusting relationships with staff and faculty members.

Just as citizens of Appalachia may possess a hesitancy or lack of openness to those who they perceive as non-native, individuals who seek to lead schools and are recognized and accepted by their communities as Appalachian may face different challenges. As Appalachians may have developed a historical mistrust of outsiders due to past abuses or ineffective interventions, they have also been presented with external values and cultural ideals which may run counter to those of the region. External pressures

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to change and conform to a larger external set of expectations is not new to Appalachians. Traditional values rooted in stability, family connectedness, historical significance and local relationships may seem juxtaposed to educational reform efforts which encourage individual achievement, consumerism, modernization and success based on external, seemingly non-tangible factors. Appalachian principals no doubt understand and most likely have these traditional values woven into their personalities and perspectives to some degree. To embrace and apply them too liberally as a leader in relationships with teachers and educational stakeholders could lead to instructional stagnation or retreat. To divest oneself of these characteristics completely might result in a perception by colleagues and community members as being disingenuous or fake, thus potentially breeding uncertainty or a lack of trust among Appalachian locals.

New Appalachian principals, whether native or transplanted to the region, would be well served to partner with experienced Appalachian school administrators who can serve as confidential and supportive mentors for new principals of the region. State educational guidelines and regulations for instructional expectations and school operation are specific and finite in nature. They do not lend themselves to a great deal of interpretation or latitude in their application. Regulation might be mandated from beyond the Appalachian county border but implementation occurs from within. Principal relationships with teachers which foster trust, respect and open communication will ensure the greatest support of initiatives focused on student success.

A much larger issue and one which has received significant recognition in all educational settings is the relationship between student achievement and poverty. Per pupil expenditures indicate that on average Appalachian high schools spend more on

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children than the state average, though those higher levels of funding might be in response to the greater material support needs presented by students from this high poverty region. That is also not to say that the amount of funding provided to Kentucky students should be a noteworthy barometer. The challenge does not necessarily lie with ensuring that state and federal coffers provide equal or even slightly higher levels of financial support but is similar to other locations which suffer from poverty. Poor families in an isolated part of the country like Appalachia cannot provide their children with access to enrichment activities, technology resources or learning opportunities which either do not exist or are of a limited scope and thus access becomes competitive. Similarly, children of parents who remain in the Appalachian region whose families possess limited educational experience cannot be as easily expected to pursue ideals which are not modeled for them by those with whom they share the closest relationship. Even those who can be identified by students as modeling academic success and the benefits of advanced education are often presented with a paradox whereby achievement must be counter balanced with separation from loved ones due to the poor economic conditions of the region.

It would be easy to speculate that our state simply needs to spend more money on education to increase student achievement or that all levels of government and various economic development agencies should cultivate greater economic capacity for the area in order to provide greater opportunity. It is unlikely, however, that we can spend Appalachia out of its economic and educational woes. That has been attempted in the past in varying degrees and at present, has not lived up to the promises and potential which were envisioned during various implementation efforts. The current reality is that neither

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the state or federal coffers are going to provide these increases, and a greater fiscal responsibility is being shifted to the local level which is already struggling. Simply put, increasing local taxes in poor Appalachian counties is not going to result in the revenue shift on which other more prosperous counties and communities can rely.

Perhaps, as identified in the context of school level achievement and teacher-principal relationships, the answer lies in building capacity through inter-county school level relationships to form Appalachian educational regional partnerships. The economic and social conditions in most Appalachian counties are generally reflective of one another. Shared societal, economic, historical, cultural and even geographic characteristics could prove to be a connective and hopefully cohesive force. Partnerships among counties could serve as support systems where resources and knowledge could be shared based upon commonly held needs and conditions as opposed to one-size-fits-all state programs and interventions. Moving from small fragmented communities and isolated counties to interdependent groupings of four to six adjacent school districts could bring greater political and economic clout to the region if these county groups could function as a united collective. Instead of relying upon limited state initiatives tied to politics of the last century, sometimes slow moving universities or a handful of unresponsive monopolies within the region, the Appalachian collective could reach out on its own terms to a more globalized identity and potential. Instead of having outsiders try to change existing dynamics to fit their operational parameters, Appalachia could redefine itself in the same regional transformation as the New South decades ago. Unless Appalachia can identify a means of transforming itself on its own terms while not divesting itself of its core values, it will continue to struggle, stagnate and become

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irrelevant as its people leave, businesses shutter and resources dwindle just like a western ghost town.

Implications for Practice and Policy in Kentucky

The Kentucky Department of Education (KDE) will soon be implementing statewide the Principal Professional Growth and Effectiveness System (PPGES). This principal evaluation process will incorporate three elements as its means of evaluating school leadership performance: (1) Student growth results obtained through state accountability testing; (2) Vanderbilt Assessment of Leadership in Education Survey (Val-Ed); and (3) Teacher Empowerment Leading and Learning Survey (TELL). This process will utilize a two year evaluation frame which alternates administering of the Val-Ed and TELL surveys and two years of KPREP student growth data. The weight of each element has not yet been determined, but are projected to result in a quantitative score and associated level of performance for that numeric designation.

The findings of this study indicate that there was no significant statistical relationship between Appalachian high school principal leadership scores on the TELL survey and student achievement based on ACT school composite scores or gain scores of the same students based on 2010 PLAN and 2011 ACT school composite scores. KPREP student growth at the high school is based in a large part upon composite score growth in subject areas through administration of PLAN and ACT. This is somewhat disconcerting given the results of this study. Although the TELL survey only reviewed teacher responses to leadership statements, this study closely mirrors KDE's student growth measurement between the PLAN and ACT exams which will not only be used in evaluating schools via KPREP but also principals through PPGES two year cycle

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reviews. Principals across the state should recognize the narrow parameters under which their future evaluation will be based. Student achievement and student growth criteria comprise 40 percent of a high school's KPREP accountability and thus will play a significant role in school leader's evaluation. One must question whether one or two years of student achievement data based on one annual administration of a national assessment is a practical evaluation tool for determining principal leadership.

There are a number of aspects which make utilizing TELL survey data questionable as a means of evaluating principals or a basis for developing leadership growth expectations. Most notable is the criterion that only 50 percent of a school faculty respond to the survey in order for the collected responses to be considered valid. If educator feedback is indeed a critical component to school and administrator improvement and desire to increase the quality of leadership so great, then how much significance can be placed in an instrument with a response which only employs 50 percent participation as its threshold? If we expect school administrators to lead all faculty members toward achieving college and career readiness for all students, it would seem that a reciprocal participation rate would be expected in such an important evaluation tool, especially when it will be one of only two stakeholder feedback instruments used in evaluating a principal.

Further, this researcher contends that teacher identification be more specific on the TELL survey than simply membership on a school faculty? It is understood that anonymity is a desirable consideration when seeking genuine feedback from staff, though it can also facilitate unwarranted responses as well. Perhaps generalized identifiers might assist a school leader in determining how best to respond to survey results. Groupings

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which identify level of education, years of experience or other generalized identifiers may assist a principal in both identifying and addressing specific concerns. For example, seasoned teachers might respond differently to a particular statement than beginning teachers, or maybe through the identification of a particular content area or grade level grouping, a principal might better address a unique concern about student achievement which arises from that respective group's TELL survey response. The statements employed on the TELL survey are relatively general in their presentation in order to fit most school environment and common conditions. The PPGES provides only one administration of the TELL survey before a two year reapplication for comparative purposes. During that time frame, the principal is expected to identify the basis for the generalized concern and employ specific interventions to address that concern noted by only some of the faculty for whom he does not know their identity. One could argue that it would be more efficient and effective if a principal, for example, could receive survey results in which 15 percent of his teachers indicated that they strongly disagreed that they had autonomy to make decisions about instructional delivery along with a group identifier which noted most of that group were math teachers or new teachers. This type of generalized identifier would not only allow principals to place teacher responses in the context of existing conditions at the school but also enable a more effective response to the specific concern. Clearly, such identities need to be implemented in a context of trusting relationships, but trust is at the heart of cultural leadership.

As mentioned earlier, when dozens or even hundreds of student achievement scores are homogenized into one single accountability score for a school it often provides a numeric symbol without school level meaning. This reservation contends that single

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ACT, PLAN or EXPLORE composite scores for a school which has two or three hundred students tested has limited usefulness, at best. State assessment needs to divest itself of rolling multiple means of measuring school and student achievement into a single number or label. For example, integrating student growth, student achievement, program reviews, graduation rates and gap reduction into one single school score and performance level determination devalues each item and masks important differences within schools. Similarly, policymakers should ask if each of these items should be evenly weighted and determine the justification for that. Unfortunately, it would seem that often times the pursuit to include an ever growing number of criteria in a numerical form in order to measure student achievement and school effectiveness has resulted in homogenization of both the contributing and culminating data. It would seem that just as accurate evaluation of individual students to determine effective and differentiated learning interventions results in the highest probability for student growth, schools would be better served by not employing standardized, one-size-fits-all evaluation and intervention tools. That is not to say schools should not be accountable, but they should be accountable for their students' own ends and purposes, not out of imposed regulatory necessity. There is a difference between high standards and standardization, and unfortunately, policymakers have over shifted to the latter.

As noted earlier, research literature supports the notion that effective leadership indirectly, not directly, influences student achievement. Stakeholders should be careful that the performance levels they expect from school leaders are not indicative of having direct influence. Successful school principals can demonstrate long term, sustained student growth through multiple strategies. This study indicates that over a two year

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period that there was not a statistically significant relationship between Appalachian high school principal leadership and student achievement on the ACT or growth between PLAN and ACT exams. If taken into account the multiple factors which can directly and indirectly influence student achievement, should we expect measurable increases in student achievement and growth as determined by a single national standardized exam of a large group? Additionally, can we hold the school principal responsible for ensuring this achievement based solely upon his or her actions over a two year period? This research calls such expectations into question. This study employs two of the three evaluation tools for the coming PPGES which will be the basis for principal evaluation over a similar two year period. The results of this study draw into question the larger applicability of PPGES to Kentucky principal evaluation. As a profession, stakeholders should decide if they can value and trust both the three elements used in this evaluation, as well as the results of this system as being so accurate that stakeholders are prepared to release experienced leaders from their ranks based upon these instruments' determinations.

Finally, according to this study's results, Appalachian teacher attainment of Rank I has no statistically significant relationship with student achievement as determined by ACT and PLAN school composite scores. If educational funding continues to stagnate and a relationship cannot be proven to exist between student achievement and teacher acquisition of Rank I, Kentucky district and state educational leaders should call into question the viability of continuing the teacher salary step increase for Rank I. Rank I is a construct which is unique to Kentucky and has no academic or financial value outside the Commonwealth unless it was achieved by completion of a second master degree or

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through National Board Certification. Even with the discontinuation of Rank I, teachers could continue to obtain course work in pursuit of career advancement or transition in educational roles as well as obtain certification toward those ends. Undoubtedly unpopular with teachers, these additional certifications, like a professional degree or doctorate in most districts, would not merit a higher level of salary. Savings achieved through discontinuation of Rank I in district salary schedules could result in shifting revenue toward direct interventions in support of student achievement.

Implications for Future Research

This study incorporated 2011 TELL survey into its research model, and at the time of this study, it was in its first application in Kentucky. At the point of this study's presentation, the 2013 TELL survey results were being released to schools for review. Further research should be pursued which identifies Appalachian high schools from this study which continue to be under the leadership of the same principal. Similarly, those Appalachian schools which have retained the same principal should have ACT and PLAN assessment data harvested which would provide student achievement and growth trends for four consecutive years. Though school demographics will probably not have changed significantly, teacher responses to principal leadership items on the 2013 TELL survey can be harvested for comparisons to 2011 TELL responses. More importantly, those Appalachian high schools which have remained under the same principal can be evaluated over a longer four year period to determine if a relationship can be identified as existing between leadership and student achievement on ACT and PLAN examinations.

As the state moves from administration of the PLAN and EXPLORE examinations to new instruments for determining college readiness to be selected for

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implementation in the 2015-2016 academic year, researchers will be faced with yet another change in assessment. This makes long term comparative data comparisons disjointed and prohibitive to trend data interpretations for many years or until the instruments are changed yet again. There is an old adage, if you want to measure change, don't change the measure. Frequent changes in curricula and assessments have diminished the ability to make decisions based on longer and more reliable data. Until the Department of Education is able to solidify a consistent vendor and evaluation system of students, it will be difficult to determine if school leaders are maintaining consistent student achievement growth in their respective schools and thus rely upon student performance data trends as a means of evaluating school improvement or principal effectiveness.

In addition to increasing the time frame of this study, the research could also be expanded to include high schools from across the state in order to increase the sample size. Similar measures could be employed and provide an overview of the relationship between all Kentucky high school principals and student achievement. This broader scope could also provide a data base for comparing Appalachian school leadership with non-Appalachian Kentucky principals.

One of the limitations of this study is rooted in school level data analyses which likely masks differences in ratings and achievement that exists between teachers in schools. A study using teacher and/or student level data could be conducted in an effort to identify specific teacher and student related characteristics associated with student achievement in relationship to principal leadership within a school.

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Another expansion of the study could employ qualitative research as a means of determining why teachers rate their principals as they do. Similarly, case studies could be conducted to explore how and why principal leadership ratings differ between high and low achieving Appalachian high schools.

Closing Reflections

The Appalachian region of Kentucky represents an environmentally rich and culturally unique area of the United States. The people of its mountains and hollows have come to treasure its beauty and share a heritage of resourcefulness and self-reliance. Unfortunately, the world beyond Appalachia has historically either embraced a perception of indifference or condescension toward its inhabitants as natural resources were plundered and promises unfulfilled. In some ways, Appalachia seems trapped in an identity in which its core values are uncompromisingly held true but at the same time seem unsustainable or outdated.

As the visions and promises of politicians, social activists and absentee businessmen continue to fall short of the mark; Appalachians' greatest potential for growth and advancement continues to lie with education. Each day, educators strive to break the ongoing cycle of poverty in the region and combat the mistrust often aligned with outside influence. Appalachian school leaders and those teachers they lead strive to rethread a new fabric for the region which maintains rich and positive cultural values in complementary and unsuspecting union with supportive external influences that can potentially return individual and community vitality and relevance. Heavy handed, one-size-fits-all interventions imposed by external forces of authority after extended periods of neglect or even abuse have not proven economically successful, nor will the same hold

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true in the realm of education. Kentucky's Appalachian inhabitants did not suddenly find themselves isolated in poverty any more than their children recently determined to be achieving at less than satisfactory levels. These conditions have festered in the region for decades, and it will take years of focused support and specific interventions which address these Kentuckians' unique needs and circumstances. "Quick victories" and short term objectives generically employed by school leaders pressured with the prospect of losing their jobs based on annual or two year cycles' results will not provide genuine momentum, much less sustained long term educational success for Appalachian students.

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	National Association of Laboratory Schools
	National Council of Social Studies Teachers
	National Council of Teachers of English

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Awards	Center for Middle School Academic Achievement European Environmental travel grant for \$1000, 2009. ATT/Connect Kentucky Grant for 10 laptop computers for student check out valued at \$10,000, 2009
	Wachovia Lite Research Grant through Harvard University, KDE & WIDE World, in the amount of \$10,000, 2008 - 2010
	ConnectKentucky Grant for 15 computers in support of high school Special Education Students valued at \$12,000, 2008.
	EKU Funding Awards, 2007
	Model Library Collection - \$10,000
	Model Grill Upgrade - \$5,000
	Model School Safety Upgrade - \$5,000
	Model Industrial Technology Update - \$5,000
	Model Auditorium Upgrade - \$15,000
	Recognized by Richmond Register as one of Madison County's Top Principals, 2007 & 2008
	One of 50 United States teachers recognized with a Toyota International Teacher Award and instructional tour of Japan, 2001
	Model Laboratory High School Teacher of the Year Award, 1998 and 2001
	"Teaching About Asia" resource funds awarded by the Indiana University Department of Southeast Asian Studies in the amount of \$500, 1999
Presentations	Co-Presenter, Model behavior: Cultivating cross curriculum, intergrade, and interdepartmental professional relationships in schools and colleges of education.
	International Association of Laboratory Schools Annual Conference, Louisiana State University, Baton Rouge, LA. March 6, 2013
	Co-Presenter, Creating a helpful roadmap for cultivating international exchanges.
	International Alliance for Invitational Education World Conference, Eastern Kentucky University, Richmond, KY. October 27, 2011
	Co- Presenter, A vision of excellence for the 21st century. National Association of Laboratory Schools National

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Conference, Ball State University, Muncie, IN. April 9, 2010

Speaker, American schools and culture.

International Summer Academy, University of North Carolina – Charlotte. July 30, 2007

Speaker, Secondary Education in the United States.

International Summer Academy, University of North Carolina – Charlotte. August 1, 2006

Speaker/Presenter, Young Abe Lincoln in Indiana.

Lincoln Boyhood National Memorial. Spring 2005

Co-Presenter, Architecture, Art and History: A Collaborative Unit of Study addressing local architecture from an artistic and historical approach.

National Association of Laboratory Schools Southeastern Regional Conference, Eastern Kentucky University, Richmond, Kentucky . October 13, 2000

Co-Presenter, History Repeats Itself in English Class.

Joint National Conference of the National Council of Teachers of English and the National Council of Social Studies, Washington, D.C. July 17, 1999

Co-Presenter, History Repeats Itself in the English Class.

Southeast Regional Conference of the National Association of Laboratory Schools, Berry College, Mount Berry, Georgia. October 26, 1998

College Courses Taught	Spring 2010	HIS 202: American Civilization to 1877 Eastern Kentucky University
	Summer 2006 & 2007	EMS 842: Discipline & Classroom Management Eastern Kentucky University
	Fall 2006	EMG 810: Middle School Curriculum Eastern Kentucky University
	Spring 2003	EMS 830: Multicultural Populations & Curriculum Eastern Kentucky University
	1993 – 1996	Various United States, world & Kentucky history courses

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		Kentucky Community and Technical College System
Educational Travel	Spring 2011	Hong Kong and Peoples Republic of China
	Fall 2010	Japan
	Summer 2009	Austria, Germany, and Switzerland
	Summer 2001	Japan
	Spring 1986	Peoples Republic of China
Manuscripts Published	“What are we packing for their trip: International travel and its value in preparation of teachers and students for tomorrow’s environment.” The Kentucky Middle School Journal. Volume 10, No. 1: 55 – 59.	
	“The Kentucky volunteer foot soldier in the Mexican War: A social history of Company B, Second Regiment, Kentucky Infantry Volunteers.” Kentucky Historical Society Register. Volume 95, No. 3: 237 – 283.	
	Multiple newspaper articles published in Richmond Register addressing education, 2004 - 2007	