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LEADERSHIP, CURRICULUM, INSTRUCTION, AND ACCOUNTABILITY
SCORES: EVIDENCE FROM KENTUCKY SCHOLASTIC AUDITS

By

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B.A., Western Kentucky University
M.A., Western Kentucky University

A Dissertation
Submitted to the Faculty of the
Graduate School of the University of Louisville
and
Graduate Studies and Research at Western Kentucky University
In Partial Fulfillment of the Requirements
for the Degree of

Doctor of Philosophy

Department of Leadership, Foundations, and Human Resource Education
University of Louisville
and
College of Education and Behavioral Sciences
Western Kentucky University

May, 2007

LEADERSHIP, CURRICULUM, INSTRUCTION, AND ACCOUNTABILITY
SCORES: EVIDENCE FROM KENTUCKY SCHOLASTIC ADULTS

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A Dissertation Approved on

March 26, 2007

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DEDICATION

This dissertation is dedicated to

God

For it is by his grace that all things are made possible;

Bettye Jean McKinney

my wife who has carried many burdens
while supporting me in this work with
love, encouragement, and strength,

Lonnie and Imogene McKinney

my parents who provided my growth in leadership
through their Christian endeavor to raise eight children,

Sheri, Brad and Jonathan

my children who endured the sacrifice of resources for a father
to complete the doctoral process,

Jessica

my daughter-in-law who has given me two wonderful grandchildren, and

Ashley and AnnaMarie

my grandchildren to whom I hope to pass the love of learning.

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Dr. Douglas Smith, of Western Kentucky University, is primarily responsible for methodology support and management of study data. His specialization in statistics underlies the complex process of statistical detail and aids in defining results of the study.

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Dr. Terry Brooks, Executive director of Kentucky Youth Advocates, and Dr. Mark Condon, University of Louisville, served on my dissertation committee. Both have been earnest in their support and diligent in a task of their own accord to support my dissertation work.

I am grateful to faculty members at Western Kentucky University and the University of Louisville for assisting me in this learning journey. One requires assistance at every level of service to complete the numerous details of doctoral requirements. To their professional credit, staffs at both universities are due my utmost appreciation.

ABSTRACT

LEADERSHIP, CURRICULUM, INSTRUCTION, AND ACCOUNTABILITY SCORES: EVIDENCE FROM KENTUCKY SCHOLASTIC AUDITS

Lonnie E. McKinney

March 26, 2006

High-stakes accountability, standards for improvement, global perspectives, and social considerations are re-defining the educational process. These powerful forces shake foundations and traditions, restructure organizational expectations, and change the role of all stakeholders. As these tremors reach the local school level, tremendous pressure is applied to respond precipitously. Measurement of school performance against standards places deficiencies in the limelight. At the local level, Kentucky school principals bear the primary burden for school success as clearly defined by the state's accountability system. Based on Kentucky's Standards and Indicators for School Improvement and its accompanying Scholastic Audit procedures, an explicit purpose of this study is to identify critical factors relevant to principals and their impact on accountability goals through leadership, curriculum decisions, and instructional practice within their buildings.

Data from 181 audited elementary schools are compared to Academic Index scores to determine the effect of principals on student outcomes, both directly and indirectly as mediated by curriculum and instruction. Kentucky's accountability process assigns high-stakes responsibility to school leadership, particularly in the area of instructional leadership. Most researchers agree that principal effects on student achievement are primarily a mediated effect. In the study model, Instruction accounts for 36% of the

variance in Academic Index. Leadership in turn explains 36% of the variance in Instruction. Curriculum produced little of the Academic Index variance and Leadership accounts for only a small amount of achievement variance directly.

The study quantifies achievement effects of elementary principals, exposes the reality of leadership in a high-stakes accountability environment, and discusses gaps in the support needed by school leaders to achieve accountability goals. Results are embedded in demographic variables and reveal new insights for improving struggling schools.

Regression analyses reveal relationships and the extent to which variability of school achievement results is explained by Kentucky Standards--Curriculum, Instruction, and Leadership. Findings reveal important, research based, understanding of Kentucky's whole-school improvement model and details specific considerations for elementary school leadership. These analyses provide hope that Kentucky's most disadvantaged schools may finally have an improvement process that is equal to the challenge.

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CHAPTER I

STATEMENT OF THE PROBLEM

Leadership Reform

In many organizations, discontent with leadership is extraordinarily high, and leaders need to take note (Kouzes & Posner, 1993, p. 25). Americans have seen a large-scale erosion of employee confidence in management over the last decade (p. 33). Recent scandals in corporate and political leadership have contributed to further erosion of confidence in leadership. In addition, expectations have changed at a sufficiently rapid rate to create the appearance of incompetence among some of those with long tenure in leadership roles (Leithwood, Begley, & Cousins, 1992, p. 11). The media continuously remind Americans that the country lacks a national vision and forward-looking leadership. Educational leadership does not stand totally apart from American leadership in general. School leaders are increasingly viewed through the same lenses, receiving similar scrutiny.

In established organizations, seeing reality is often more difficult because it means letting go of ingrained ways of thinking and working--the organizational culture (Tichy, 1997, p. 29). Historically, American education provided school outcomes that were consistent with the labor needs of society (Cremin, 1961; Nasau, 1979; Perkinson, 1977; Tyack, 1974). Life within the organization was based upon assumptions that schools and knowledge were static and achievement was dependent upon the characteristics of the student body (Meyer & Rowan, 1977, 1978; Miller, 1992). Today, educational leaders are confronted with a vastly different world on a near daily basis and school outcomes or

expectations are tempered with current social and cultural shifts. For example the concept of “No Child Left Behind” is in considerable contrast with certain traditionally acceptable practices of selective disenfranchising. Traditional responses to change are no longer viable and leaders are scrambling to find the means, skills, and courage to challenge the status quo. Maintenance learning, which most organizations and educational institutions have practiced, seeks to preserve the status quo (Bennis, 1989, p. 78). Sadly, the perceived failure of this traditional approach has masked the many positive contributions and success stories of public education (cf. Berliner & Biddle, 1995).

Almost every significant breakthrough is the result of a courageous departure from traditional ways of thinking (Covey, 1992; Kuhn, 1996). In the words of Thoreau, “For every thousand hacking at the leaves of evil, there is one striking at the root” (cited in Covey, p. 67). Educational leaders need the training and opportunity to shift effort and resources upstream to prevent some of the problems currently so devastating to effective educational practice. Leaders need the freedom to focus on principles that can bring long-term results, in addition to the immediate accountability demanded by reform efforts (Bolon, 2000; Elmore & Furman, 2001).

Kentucky Reform

The Kentucky Education Reform Act of 1990 established firm accountability guidelines for schools (Steffy, 1993). The value-added assumptions being tested (Miller, 1992) have considerable grounding in current theory and research (Furman, 2001; Linn, 2000, 2003; Smith & O’Day, 1991). Expectations for improving performance assessment outcomes place increased pressure on administrators to utilize this knowledge base to upgrade curriculum and instruction. To meet these goals, school leaders must have the ability to direct staff decisions in ways that facilitate learning for all children, regardless of

background. Keeping up with recent studies enables the leader to keep the school community informed and on track.

Kentucky goals address what leaders need to know and be able to do to support teachers and students in a high performing school (Kentucky Department of Education [KDE], 2006b). Although leaders have a broad range of responsibility, in Kentucky's high-stakes accountability arena, goals and standards clearly focus on instructional leadership. Principals continue to be responsible for a broad range of traditional duties, but the role of instructional leadership has a high priority in on-going reform. All instructional leadership programs in Kentucky are required to support the following (KDE, p. 7):

1. Kentucky State Board of Education Goals and Objectives
2. Standards and Indicators for School Improvement (SISI)
3. Interstate School Leaders Licensure Consortium (ISLLC) Standards for School Leaders
4. Kentucky Department of Education Standards for Professional Development.

Instructional priority for the principal is delineated by statute in what is commonly referred to as the Effective Instructional Leadership Act (EILA). Specific wording of the act follows:

Legislative action, KRS 156.101, established legal support to encourage and require the maintenance and development of effective instructional leadership in the public schools of the Commonwealth and to recognize that *principals* with the assistance of assistant principals, supervisors of instruction, guidance counselors, and directors of special education *have the primary responsibility for instructional leadership* in the schools to which they are assigned. (KDE, 2006b, p. 4, emphasis added)

Instructional leadership duties are clearly outlined in a technical assistance manual for instructional leaders and training program providers as follows:

1. making instructional decisions that support teaching and learning;

2. establishing organizational direction;
3. developing and supporting high performance expectations;
4. creating a learning culture; and,
5. developing leadership capacity. (KDE, 2006b, p. 4)

The Kentucky Board of Education has adopted *Standards and Indicators for School Improvement* (SISI) as the measure of a school's preparedness for increasing student achievement (KDE, 2004d). The accompanying documents--*District Level Performance Descriptions and Glossary for Kentucky's Standards and Indicators for School Improvement* (KDE, 2004a) and a parallel manual for schools, *School Level Performance Descriptors for Kentucky's Standards and Indicators for School Improvement* (KDE, 2004c)--identify the responsibility of the instructional leader in improving the academic performance of students, the learning environment, and organizational efficiency of their buildings. Instructional leadership activities are expected to be consistent with specific competencies identified in the SISI document. Three of the nine standards represent the leadership of Kentucky principals and the key areas of curriculum and instruction in the quest to reach high-stakes accountability goals. These focal standards are listed below (KDE, 2004d). A complete list of the nine standards appears in Appendix A.

Standard 1: The school develops and implements a curriculum that is rigorous, intentional, and aligned to state and local standards. (p. 6)

Standard 3: The school's instructional program actively engages all students by using effective, varied and research-based practices to improve student academic performance standards. (p. 8)

Standard 7: School/district instructional decisions focus on support for teaching and learning, organizational direction, high performance expectations, creating a learning culture, and developing leadership capacity. (p. 20)

These three standards form the core of this study's effort to determine the effect of

leadership in general, and particularly instructional leadership, on Kentucky performance outcomes as schools strive toward educational goals in a high-stakes environment.

Standard 7 is specifically designed to evaluate school leadership, aligned with ISLLC standards, and consistent with Kentucky's accountability goals. Standard 7 acknowledges influences on leadership such as district policy support and Site Based Decision Making (SBDM) councils, but the focus is largely upon the school principal. Principals are legally identified (KDE, 2006b) as the primary responsible party in providing instructional leadership in Kentucky schools. Standards 1 and 3, as noted above, are designed to ensure quality curriculum and instruction, respectively.

Kentucky principals bear ultimate responsibility for their school's learning success. Accountability measures place these building leaders at the front line of Kentucky's educational reform. Accountability consequences clearly rest heavily on the principal's leadership ability. Kentucky principals are well aware of this intense pressure, a force felt across the nation. For example, Robin Lake and colleagues (cited in Lashway, 1999b, p. 4) in a Washington state study found that most schools report pressure for accountability has made improvement of test scores a major priority. There is little doubt that accountability is a driving force in principals' school decisions and leadership activities.

The Commonwealth Accountability Testing System (CATS) combines criterion-referenced assessment results on the different content areas, along with norm-referenced scores and non-cognitive results, into an overall Accountability Index. The index value identifies each school's position in terms of progress toward a goal of proficiency (school score of 100) by 2014 (Petrosko, 2000). The Accountability Index has taken on tremendous symbolic importance with regard to the school's prestige, rewards, and consequences. With respect to the principal, the author's experience suggests the unstated

assumption that the index is also an effective measure of leadership ability.

Instructional Leadership in Kentucky

Educators have long noted the importance of leadership in successful schools. In recent years, much attention has been given to the fact that effective school principals are instructional leaders (Hallinger, Bickman, & Davis, 1996; Hallinger & Murphy, 1985; Murphy, 1988; Murphy, Hallinger, Weil, & Mitman, 1983). Instructional leadership is a key requirement in Kentucky's school reform initiative, is embedded within legislative action, and is a significant factor in Kentucky audits of school leadership (KDE, 2006b). Of course, Kentucky principals have a broad range of responsibility in leading schools but the primary focus of high-stakes accountability revolves around improved student achievement. Making instructional decisions that support teaching and learning and creating a learning culture are leadership expectations that clearly expand the traditional principal's role.

Currently there exists an underlying assumption that successful Kentucky principals are effectively achieving goals for instructional leadership. There is also an assumption that this leadership success is reflected in continually improving school outcomes on track to reach the goal of proficiency (100 on the Accountability Index). This is implicit in the presumption that leadership has an impact on the quality of curriculum and instruction within a building, the two factors most immediately associated with the student's learning (cf. Lockwood, 1994).

However, there remains the possibility that what has been presumed to be instructional leadership in reality is subsumed within a broad range of factors that affect accountability results (i.e., demographics, staff experience and expertise, stakeholder support, parent involvement), apart from leader behaviors per se. Is it possible that

principals in fact do not have the skills needed to make the best instructional decisions? Is it possible that principals lack skills needed to create an effective learning culture? If Kentucky can move beyond presumptions to evidence-based reality, subsequent professional leadership development may be more efficacious for guiding school leadership in the quest toward the world class standards (cf. Rothstein, 2004, Chapter 3) embedded in the CATS performance assessments.

It would be very useful to expand the knowledge of principals' effectiveness based on direct evidence on the relationship between instructional leadership and the quality of curriculum and instruction. This can be accomplished by examining Scholastic Audit scores in Kentucky schools; these audits represent a cross section of Kentucky schools, both successful and struggling. Audit scores are available for all nine standards established for Kentucky schools, but the specific relationships among leadership, instruction, and curriculum are particularly germane in light of statutes assigning principals primary responsibility for these school outcomes.

Knowing the degree to which these three components affect school success would represent a significant step in understanding instructional leadership, particularly under the conditions of high-stakes accountability. That is, the pressures of accountability may alter leadership behaviors. In fact, accountability models are premised upon the assumption that school personnel will alter their beliefs and practices for the better, thus effecting positive change. Limited research exists, however, that has examined these assumptions under such high-stakes conditions.

The Kentucky Education Reform Act of 1990 (KERA) has attracted considerable attention and debate (Pankratz & Petrosko, 2000; Petrosko & Lindle, 2000). It is a broad ranging effort, attempting to transform the very culture of public schools. The impact of

reform on students and schools has been widely discussed (cf. Poggio, 2000), and a number of studies have focused on curriculum and instruction or the learning climate (e.g., Ennis, 2002; Lumsden, 1996; Luvisi, 2000). Likewise the effects of demographic factors on accountability scores have been examined extensively (Guskey, 1997; Moore, 2003; Roeder, 1999, 2000, 2001).

However, reforms aimed at school administrators have attracted less media attention, and few studies expose the means by which principals impact achievement and how contextual forces influence the exercise of leadership in the schoolhouse (Hallinger & Heck, 1998, p. 157). Added to this leadership mix is the high-stakes effect of Kentucky accountability in addition to the now powerful No Child Left Behind Act (2001). KERA constitutes considerable change in its view of school leaders. Yet little is known on how high-stakes accountability affects principal leadership in Kentucky or elsewhere.

Apart from leadership generally, what are the more subtle changes in practice that seem to be guiding Kentucky administrators toward an effective response to school improvement and accountability pressures? District and state supervisors have become more specific in directing administrators to be cognizant of state goals and to support research-based instructional practices (KDE, 2004a, 2004d). School personnel searching for new principals are very aware of accountability needs and therefore are more inclined to search for qualities of instructional leadership in applicants. The author's experience suggests that increased pressure for accountability has encouraged administrators unwilling to respond to this demand to retire or find work outside instructional responsibility. Many grant opportunities for schools require accountability for curriculum results and participating administrators must assure the proper implementation of grant terms. All of these and similar pressures are pushing principals in the direction of daily instructional

priorities.

In addition, Kentucky furthered its reform initiative by adopting administrator standards that reflected the state's educational goals in 1994, although the impetus of these changes remained focused on curriculum and accountability. This was reflected in the research conducted on KERA, as noted above. However, leaders soon realized that change had fostered a growing shortage of qualified, high-quality principals (Institute for Educational Leadership [IEL], 2000, p. 1). The issue of leadership continues to be one that distinguishes high achieving schools from low performing schools. The importance of school leadership was becoming more obvious among high performing schools (Division of School Improvement, 2003). The adoption of standards was a step toward clear expectations but little structural change was offered to enable the energy and resources of principals to be channeled toward the leadership standards. Some advocates feel that principals were never appropriately prepared or provisioned to implement Kentucky's broad range of reform. Principals were simply expected to discover curriculum innovations and lead schools to accountability success. Few realized the burden of accountability would fall so heavily on principals, especially in states like Kentucky that are undergoing systemic school reform (Winter & Morgenthal, 2001).

The state continued its pursuit of leadership reform by actively participating in the Interstate School Leaders Licensure Consortium, an effort to compile a common set of standards which were applicable to all school administrators and accepted more broadly across state boundaries. The ISLLC Standards are a significant part of Kentucky's current guide for leadership development and reform. (ISLLC standards are listed in Appendix B.) ISLLC Standard 2 clearly refers to the administrator's responsibility for instruction/curriculum.

A school administrator is an educational leader who promotes the success of all students by advocating, nurturing, and sustaining a school culture and instructional program conducive to student learning and staff professional growth. (Council of Chief State School Officers, 1996, p. 12)

Kentucky's *Standards and Indicators for School Improvement* (KDE, 2004d)

constitute the basis for monitoring school leadership in Kentucky and are used in all school audits/reviews. A comparison of Appendix A and B reveals that the integrity of ISLLC standards is maintained throughout the SISI standards. The challenge remains to provide all leaders a skill package and an organizational environment enabling them to achieve the goals set forth in Kentucky's standards.

The Problem

In 1999, Kentucky aligned its leadership standards with those proposed by the Interstate School Leaders Licensure Consortium (ISLLC). While it may be argued that leadership reform should have preceded the broader school reform initiative (KERA), there is broad consensus for making immediate amends. But where does the process begin? What are the urgent needs? Do current practice and/or policy enable or hamper goals?

Kentucky's broad based reform efforts (Steffy, 1993), recent efforts in reforming school leadership (KDE, 2004d), and the adoption of the ISLLC Standards (KDE, 2006b) are all related to improving Kentucky's leaders. Legitimate efforts to improve school leadership should begin with research-based answers to leadership questions. A clearer picture is needed to determine issues of paramount importance for enabling high-performing school leaders.

Leadership development efforts imply the need to move current and future leaders from their present level of ability to a level identified by adopted standards. To maximize development efforts, resources need to be concentrated in areas where the most significant

differences exist between current and desired leadership ability. When, where, and how can the experiences of future school leaders be constructed so as to contribute best to the development of effective orientations to the role? When, where, and how can current leaders improve their orientation to new and changing expectations? Identifying the current impact of school leaders becomes an important step in postulating new leadership development concepts.

These perspectives on leadership, more generally the *lack of empirical data* on Kentucky principals' behaviors, particularly as influenced by high-stakes accountability, represent the problem this study addresses. Higher expectations and explicit accountability goals make Kentucky media headlines regularly but too little is known about the actual impact of principal leadership or the extent that specific leadership standards affect school outcomes.

Kentucky's Scholastic Audit

The centerpiece of Kentucky's system of public education is its vision of what students should know and be able to do as a result of their school experience. The primary purpose of Kentucky's school audits is to assess the educational opportunities that students experience each day in the classrooms. Kentucky's future relies on the commitment to providing high quality teaching and the finest learning opportunities for each and every child. Scholastic audits support this commitment by nurturing high expectations for all students, ensuring a safe and supportive place for all students, and engaging parents and other community members in helping students achieve high academic expectations (Division of School Improvement, 2003, p. 7).

The Division of School Improvement (2003) report is the result of scholastic audits or reviews conducted during the 2000-2001 and the 2002-2003 academic school years. The

audit is designed to examine a school's overall learning environment as related to the academic performance of students. It is about transforming schools into places where high-level knowledge permeates the culture and drives all efforts. The actual audit is organized by the nine standards in the SISI document.

Two hundred and seventy-two elementary and secondary schools were audited in Kentucky's first two rounds of audits, providing a look at the efforts that schools had made to overcome obstacles and meet the challenges that schools face in getting to proficiency. KDE analyzed and published the results of these audits in 2003 (Division of School Improvement). This study reviews the aforementioned audits along with successive audits through 2005. Scholastic audits are labor intensive and require extensive training on the part of the external audit team, consisting of a parent, teacher, school administrator, district administrator, university faculty member, and a Highly Skilled Educator. Audit teams were trained by the Kentucky Department of Education. KDE has not continued to publish a review of audit data as it did in 2003. Only brief charts of notable findings (Common Variance Points) may be found on the KDE website. After three audit cycles (2000-2001, 2002-2003, 2004-2005), the KDE identified 11 Common Variance Points which are listed on the KDE website (KDE, 2006f) and included here as Appendix F. (KDE changed the criteria for determining that a given indicator was significantly different between high and low achieving schools. This explains the different number of Common Variance Points when the third cycle of audits was included.)

Not all schools have been audited. Schools with scores that placed them in the lowest one-third were classified as Level 3 and received a scholastic audit. Schools with scores that placed them in the middle third were classified as Level 2 and received a scholastic review. Schools with assessment scores that placed them in the upper third were

classified as Level 1. All Kentucky schools are encouraged to conduct a self-review using *Standards and Indicators for School Improvement* (KDE, 2004d). For comparative purposes, reviews were also conducted in a sample of successful schools (Division of School Improvement, 2003, p. 9).

Thus, the current database of school audits is somewhat limited. The database is primarily composed of struggling schools, since these schools may be required to submit to a scholastic audit. The available evidence is reflective of only five years of audits, but the information provides insight into the actual functioning of the challenges faced by low performing schools and their efforts to address these problems. The data provide perspective on the internal workings that distinguish schools that have met their accountability goal (successful) from those that have not (needing improvement).

Purpose

In view of Kentucky's goals for principals, this research proposes to determine the effect of school leadership (principals) on school success. School success, the dependent variable, is determined by assessment results, based on the CATS Accountability Index. (To match the research more closely with supporting demographic data, the researcher has determined that the dependent variable will be the schools' Academic Index; this choice is clarified in succeeding chapters.) Independent variables are measures of principal leadership as defined by Standard 7, as well as Standards 1 and 3, Curriculum and Instruction, respectively. Data are obtained from Kentucky School Audits. Kentucky schools are expected to reach a score of Proficiency (an Accountability Index of 100) by the year 2014. Although a few high performing schools have already attained this goal, most schools still face a significant challenge in the years ahead. The quality of instructional leadership will be a key factor in the drive to have *all* schools reach this goal.

The study uses secondary data collected by the Kentucky Department of Education Audit/Review teams to determine the impact of school leaders (principals) on Academic Index scores. Principal behaviors are inferred from three standards. One is devoted specifically to leadership. The other two (curriculum and instruction) represent the influence of the principal indirectly. The work informs Kentucky's leadership picture in three ways. This research investigates first, the direct impact of principals on the Academic Index; second, the direct influence of principal leadership on curriculum and instruction; and third, the indirect effect of instructional leadership on accountability results as mediated through curriculum and instruction. Thus, the principals' leadership in schools and available data from Kentucky's Scholastic Audits are joined in the central research question for this study: Based on Scholastic Audits, what are the effects of Leadership, Curriculum, and Instruction on Kentucky accountability scores?

Research Questions

Kentucky principals function in a high-stakes environment with legislated mandates for instructional leadership and continuous school improvement. Principals in schools failing to meet established goals face numerous consequences from negative media attention to student choice in changing schools, to scholastic audit/review, and state take-over at the local school level. Evidence regarding the effects of these pressures should be reflected in Division of School Improvement Scholastic Audits conducted by the Kentucky Department of Education.

Within this high-stakes environment, the central research question addresses the impact of Kentucky principals on instruction, curriculum, and accountability scores. Data collected by state audit/review teams from various levels of successful and struggling elementary schools form the basis for analysis of these relationships.

Figure 1 represents the relationships posited among demographic factors, the three SISI standards, and the Academic Index. The following research questions guide this investigation.

To what degree do(es):

1. Leadership (Standard 7) affect Curriculum (Standard 1), Instruction (Standard 3), and the Academic Index?
2. Curriculum (Standard 1) and Instruction (Standard 3) affect the Academic Index?
3. Demographic factors affect Leadership (Standard 7), Curriculum (Standard 1), Instruction (Standard 3), and the Academic Index?
4. Curriculum (Standard 1) and Instruction (Standard 3) mediate the effect of Leadership (Standard 7) on the Academic Index, controlling for demographics?

Figure 1. The relationship of Demographic Factors, Leadership, Curriculum, and Instruction to the Academic Index in Kentucky elementary schools.

Supplemental Research Questions

The study also includes comparison to Kentucky Department of Education published findings with regard to school audit data. Two supplemental research questions

address identified indicators in which low performing schools differ significantly from successful schools. The Division of School Improvement (2003) identified these indicators as Leverage Points in the analysis of the 2000-2001 sample (see Appendix C). For the 2002-2003 sample, the Division of School Improvement changed the name to Variance Points; twenty-seven points were identified in this round of audits (see Appendix D). The Division of School Improvement found six Common Variance Points, which were present as both Leverage Points and Variance Points in the first two samples (see Appendix E). Finally, after the third cycle of audits, KDE identified 11 Common Variance Points (see Appendix F). These different sets of indicators that distinguish high and low scores on the Scholastic Audit are compared with the findings of this study, particularly those identified within the three standards investigated (Leadership, Curriculum, and Instruction). The following supplemental research questions support this investigation.

1. To what extent are results of factor analysis of the sets of indicators for Standards 1, 3, and 7 consistent with the Leverage Points, Variance Points, and Common Variance Points identified by KDE?
2. To what extent are results of multiple regressions based on Figure 1 for this study consistent with results of regression analyses based on the 11 Common Variance Points established by KDE across all audit periods?

Significance of the Study

Kentucky seems to have adopted worthy, well-researched standards for school leaders, although implementing and achieving these standards is yet to be perfected. Through extensive school audits, Kentucky has gathered data on schools ranging from successful to struggling. The primary purpose of the audit process is to identify school needs, support planning, and encourage actions to address continuous improvement and acceptable progress toward proficiency. A school's Accountability Index marks the degree of success, and a broad range of feedback is available to school leaders who wish to review

how these data relate to performance outcomes.

Without doubt, Kentucky has high expectations for its building-level principals. The accountability model stresses the importance of instructional leadership. The audit data represent the soul of a school; this research is premised upon the idea that this information can help restructure school leadership. The Kentucky Department of Education has conducted preliminary analysis of the audit data related to successful and struggling schools, examining each indicator for each of the nine standards separately. In contrast, this study focuses only on the standards for instruction, curriculum, and leadership, but does so by analyzing the interrelationships among the variables, along with their impact on accountability scores. Furthermore, the study examines the demographic context of the school and provides a theoretical framework for understanding leadership behavior. Thus, this study extends the preliminary work by the KDE and provides an empirical test of the direct and indirect influence of the principal.

From this perspective, this study could help in the discovery of the real impact of leadership reform, both intended and unintended. High-stakes accountability is envisioned as creating leadership structure that drives principals to achieve success. At present, this framework is not clearly identified; the principal's role in whole-school success is more assumed than known. If school decisions are to be data-driven, then Kentucky principals need relevant information to utilize during the daily work of reform.

Common sense would imply that effective principals lead successful Kentucky schools. As reform has evolved, Kentucky principals have been more and more expected to be instrumental in guiding instructional decisions. Instruction and curriculum, along with the principal's leadership, are viewed as important factors in achieving a successful Accountability Index score. But it is often wise to test common sense with empirical

results. In fact, the principal's leadership skills may be lacking in certain areas in struggling or even successful schools. Kentucky's school audit data may be useful in gaining a better understanding of leadership dynamics. In turn, school leaders can bring resources to bear on obstacles principals face in reaching goals. Implications for professional development, certification, training, instructional leadership skills, leadership policy, accountability measures, principal retention, and continued improvement of leadership are all possible contributions of the study.

Since the implementation of KERA (1990), very few empirical studies have been undertaken with a focus on the leadership issues of Kentucky principals. This study adds to the few on record; more specifically this study reflects leadership as embedded within Kentucky and ISLLC standards. The study also provides Kentucky policymakers with "from the trenches" data on principals obtained by trained auditors and aligned with Kentucky goals. The instrumentation used by audit teams to obtain data is consistent for all schools and available to all schools for improvement planning purposes. School accountability scores can hardly be attributed to school leadership alone; therefore, it is useful to know how leadership for accountability is mediated by curricular and instructional goals.

High-stakes accountability has led to many assumptions about school reform, particularly as pertaining to instructional or transformational leadership, typically without a good measure of building level behavior. It sometimes escapes those who speak admiringly of visionary leaders that road maps are useless if all one knows is where one is going (Schlechty, 2001, p. 172). It is important as well to know where one is presently located (p. 172). This study replaces some of the reform assumptions with a research view based on data from within schools.

Kentucky goals clearly establish high leadership standards for principals.

Accountability scores are a common reference for judging principal performance. But a single school score, which was never designed to measure principal effectiveness, leaves the reality of leadership unclear. Broad acceptance of accountability scores, without knowledge of the internal dynamics of schools, may be concealing certain issues that actually erode reform and the intended focus on leadership. This study clarifies principal performance with data designed to quantify principal leadership within the confines of Kentucky's documented expectations for principals.

In addition to leadership performance in general, the study examines leadership through its effect on curriculum and instruction. Kentucky *expects* principals to provide instructional leadership, and the school audit process *inspects* those instructionally based behaviors. It has been presumed that high accountability scores reflect good instruction and quality curriculum, but less is known about the role of principals in achieving those outcomes. Thus, this study is also an effort to clarify Kentucky principals' ability to effect curricular and instructional quality.

Limitations of the Study

The explicit purpose of this research study is to identify critical factors relevant to Kentucky principals and their impact on leadership, specifically vis-à-vis accountability scores. From this vantage point, guidance may be provided for further leadership development efforts. The data to be reviewed are particular to the Kentucky setting, as is the primary data-gathering document, as developed by the Division of School Improvement, *Standards and Indicators for School Improvement: A Kentucky Model for Whole School Improvement* (KDE, 2004d). Thus, the study results will be confined to Kentucky. However, even though the study is framed by Kentucky goals and standards,

many of these same standards can be found across the country so that these evaluative data may have implications for leadership and accountability generally.

Any study of leadership is likely to be influenced by circumstances and philosophical concepts particular to the point in time in which the investigation occurs. The field's conceptualization of organizational processes, including the school leadership construct, is constantly evolving (Hallinger & Heck, 1998, p. 159), forcing researchers to pursue an elusive and moving target. Several specific limitations, beyond the general concerns just noted, derive from both content and methodological issues.

1. Only elementary school data are analyzed. Middle and high school settings are considerably different. This factor limits generalizability so that results may not apply to all Kentucky principals.

2. The data are collected by various audit teams. Although the teams are trained by KDE and all teams use the same document to gather data, individual team characteristics and quality of training may temper the audit results. No interrelated studies of varying audit teams have been performed to the researcher's knowledge.

3. One-hundred and thirty-one schools were audited during the 2000-2001 school year. During the 2002-2003 school year, 114 more audits were conducted, with additional audits in ensuing years. Confining the study to elementary schools finally yielded a database from 181 schools over the five years of audits reviewed. Audits are based on and/or triggered by the previous year's accountability score. The school fabric may have changed considerably during this time, especially in schools pressured by scores that indicate poor performance, i.e., schools in Kentucky generally may well be achieving at a higher level in successive years, a prospect supported by the evidence statewide of overall achievement gains since KERA was implemented (cf. discussion in Miller & Moore,

2006). It is likely that school staff may have changed and even possible that the school had new leadership. Thus, the audits represent different time frames. Yet the respective audits should paint a picture of schools at the time the index was achieved. Although the schools may have changed since their audits, the relationships depicted should represent the effects of leadership sought by this study.

4. Perceptions are influenced by context. Educational context has both historical and more ephemeral dimensions. A number of factors may affect the administration of the audit, ranging from the legacy of KERA to the timing of CATS testing or release of accountability scores, to the daily rhythms of a “good” or “bad” day. Such factors are beyond the control of the researcher.

5. Other role groups not tapped limit generalizability. Any number of principal observers, affiliates, supervisors, or other stakeholder groups could add perspective to school leadership but are beyond the scope of this particular research study.

6. Because of the specifics of KERA (broad reform initiatives including a high-stakes, value-added accountability assessment system), results from Kentucky may not be comparable to other states.

7. Events on the global scale and socioeconomic conditions change continuously. Federal and state regulations changed to some degree during the course of gathered data causing perspectives and activities to be modified.

8. The study is based on Kentucky audit data. These are collected with an eye toward intended results (keyed to accountability scores) and it is possible they may ignore unintended effects, such as emotional health or the enjoyment of academic pursuits (actually *liking* to read or do math.). Such unintended effects are beyond the purview of this study.

9. Finally, the issue of standards is germane. Documented standards are in place for Kentucky principals, but exactly what influence standards have on practice is unclear. For example, high-stakes accountability may be guiding principal actions more so than standards. To that end, this study turns more to questions specific to Kentucky's principals, bearing in mind that standards are the "official" guide for performance. This work is informed by the standards and indicators to the extent that they are embedded in the audit instrument. Regardless of results, the specific indicators established by Kentucky for each standard guide the Scholastic Audit and scores on these indicators provide data for this study. Analysis of the indicators provides a framework for statistically interpreting results but it is beyond the role of this study to add, modify, or eliminate any indicators in Kentucky's SISI model. However, the broader philosophical underpinnings of principals' instructional leadership ultimately guide schools toward success and define pragmatically Kentucky goals for accountability.

Summary

Kentucky's educational leaders find themselves under ever-increasing pressure to achieve a broad range of learning goals. Under the Kentucky Education Reform Act of 1990 (KERA) and as defined by the Commonwealth Accountability Testing System (CATS), Kentucky schools are required to progress along a continuum toward proficiency (CATS score of 100 by the year 2014). This achievement is determined by annual testing in several academic areas (math, science, social studies, reading, writing, arts/humanities, and practical living). The score is also tempered by certain non-cognitive data (attendance, drop-out rate, and reduction in novice-rated students). In addition to state goals, schools must meet No Child Left Behind (NCLB) goals that require progress among student subgroups such as special education and minorities. Schools that fail to meet these state and

federal goals are subject to the high-stakes consequences of the CATS accountability model. School principals bear direct responsibility for success and/or consequences of these goals.

Evidence of success in a variety of school settings indicates that progress toward goals is possible, but some principals and schools seem to have certain advantages while others must overcome significant obstacles. Accountability guidelines offer little allowance for circumstance and achievement formulas presume that every school is equal with respect to the resources needed to succeed. Kentucky brooks no excuse for failure to meet goals, while NCLB requires progress in every monitored area among every identified population sub-group. Failure in any area or among any sub-group labels the school as failing to make adequate progress.

Because these accountability goals are demanding, many schools and principals may need skills and resources that are currently available on a very limited basis across Kentucky. Unfortunately, much of what is known about best practice in the classroom is often not readily available to staff in general. Teachers find it very difficult to stay abreast of recent innovations and the long term, continuous support needed to effect real change in the classroom is rarely available to principals or staff.

Principals suffer the same obstacles in school leadership. Goals and mandates arrive on the principal's plate, often with little warning or preparation and seemingly no resources to address change. It may be that school leaders need and deserve more assistance than is presently available to all schools in meeting goals. If adequate structure and skill are not available, then high-stakes consequences can be unfair, ensuring failure. Failure would indeed be an unintended and costly consequence of educational reform.

Within the context of these KERA reforms, Kentucky has undertaken a significant

initiative in developing and adopting standards for school leaders. The Kentucky Department of Education (2004d) has developed a set of nine standards, *Standards and Indicators for School Improvement (SISI)*, that are to guide schools in their quest to increase student achievement. A Scholastic Audit (Division of School Improvement, 2003) provides a profile of a school's current status under the headings of Academic Performance (Standards 1, 2, & 3), Learning Environment (Standards 4, 5, & 6), and Efficiency (Standards 7, 8, & 9). Presumably, it is the cumulative effect of all the standards that yields whole-school improvement and high student academic achievement. Scholastic audit and review teams from the state offer recommendations and next steps to improve performance. Commendations are also offered when the indicators of a particular standard are evaluated as being exemplary.

Principals are accountable for meeting a broad range of high-stakes accountability expectations including the nine SISI domains, ISLLC Standards, NCLB requirements, and other policy mandates, all directed toward school improvement. While Kentucky principals must be cognizant of these overlapping sets of standards, the primary thrust of accountability is value-added growth in student achievement. Leaders need information on what works and which strategic efforts provide the greatest return for effort vested. For example, there are nine standards in the SISI document. Are these equally efficacious? Or are there "pressure points" that represent key leverage for leaders?

One source of evidence on this issue is the data on school Scholastic Audits that have been performed by the KDE. The KDE has found selected Leverage Points based on preliminary analysis of these data (Division of School Improvement, 2003). But these findings examine each of the nine standards separately. There has been no research to date that attempts to examine these standards or some subset thereof simultaneously for their

comparative effect on achievement. Nor have there been any efforts to examine these data with respect to demographic background or theoretical linkages among these nine standards.

Accordingly, this study addresses these issues by examining audit data from the Division of School Improvement. This leads to the central research question for this study: Based on Scholastic Audits, what are the effects of Leadership, Curriculum, and Instruction on Kentucky accountability scores? The study itself is a quantitative analysis of secondary data from the Kentucky Department of Education. Although Division of School Improvement audits contain information on all nine standards, analysis of all these standards is beyond the scope of this study. Specifically, this study examines the relationships among Standard 7 (Leadership), Standard 1 (Curriculum), Standard 3 (Instruction), school accountability scores, and demographic background factors at the elementary school level, with emphasis on the influence of leadership on the other factors.

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

Since the publication of *A Nation at Risk* (National Commission on Excellence in Education, 1983), U.S. schools have experienced increasing pressure from government and business leaders to raise academic standards for all students. More recently, the No Child Left Behind (NCLB) of 2001 legislation has caused states to take a serious look at their standards and assessment programs (Daggett, 2005). The NCLB act has turned up the heat even more by putting the full weight of federal policy behind the accountability movement, mandating that schools bring all children—including racial minorities, English-language learners, and students with disabilities—to an adequate level of progress (Lashway, 2002, p. 2). The federal government has gained a great deal of control over local schools with very little money (only 6 to 10 percent of school budgets comes from federal sources) (Schlechty, 2001, p. 223).

Within the context of global and national education reform, Kentucky has taken a number of bold steps toward systemic change. Several stages of development have resulted in the adoption of leadership standards, a focus on instructional leadership, school accountability, and school audits that clearly implicate Kentucky principals as a key factor in achieving accountability goals. Three standards in particular are emphasized here. Kentucky's expectations for leadership are reviewed along with those relating to instruction and curriculum, all as they impact school accountability indices.

In the current era of accountability, educational leaders need a clear understanding of what is expected and what is valued along with the personal and organizational resources to pursue valued goals. Kentucky has adopted standards for administrators, adding definition and clarity to expectations, but personal and organizational resources probably have yet to be availed sufficiently to achieve these objectives. This is particularly the case with respect to achieving goals for certain at-risk populations and schools heavily laden with disadvantaged students. Kentucky continues to struggle with this equity dimension of reform, even more so than with the excellence dimension (cf. Miller & Moore, 2006).

The following literature review addresses Kentucky's efforts to achieve school reform, with a focus on school leadership (principals). Literature sources were gleaned from ERIC (Education Resources Information Center) and CJIE (Current Journals in Education) databases in addition to Kentucky Department of Education (KDE) publications, leadership literature, and the researcher's personal experience in educational leadership. Relevant to this study, Kentucky's attempt to improve school leadership and focus its attention on accountability goals is investigated.

The bulk of the literature review is descriptive due to several specifics of the study. For example, the study is confined by the independent nature of Kentucky's reform and Kentucky's current bent on accountability and school leadership. Limiting the review further is Kentucky's unique concept of auditing schools to uncover connections to school performance. The research data are provided by these Scholastic Audits, which are generally unparalleled in the broader field of education and accountability. A general weakness of this study is the lack of empirical study related to auditing schools for evidence of actions related to reform. Kentucky's audit may provide more insight to the

complex nature of school leadership and how it plays out in the context of direct and mediated influence on performance.

Changing Perspectives on Leadership

Formerly recognizable boundaries between nations are disappearing: between firms, between business units, and between functional disciplines (O'Toole, 1996, p. xvi). The fluidity of the environment forces organizations to adapt or lose viability to those who are able to meet new demands. Peter Drucker (cited in Covey, 1992, p. 245) teaches that within a few years of their establishment, most organizations lose sight of their mission and essential role and become focused on methods of efficiency or doing things right rather than on effectiveness or doing the right things.

It has been said that the most common underlying cause of the failure to bring about successful and meaningful change is ineffective leadership (O'Toole, 1996). Leadership is the key determinant of success, not processes, culture, techniques or scientific management but energized visionary leaders who can make things happen (Ticney, 1997, p. xv). Leadership talent capable of continuously transforming organizations to win in tomorrow's world is the most scarce resource in the world today (Ticney, p. 8).

The fact is that people prefer habitual ways of doing things to new ways, and the deepest habits of people are embodied in the structure and culture of the organizations where they live out their lives. When change begins to touch on these deeply held habit patterns and tacit assumptions, there is much more at stake than organizational efficiency and effectiveness. Careers and feelings of personal worth are at stake, as are individuals' sense of social integration and belonging (Schlechty, 2001, p. 163). These insights are just as true for schools as the broader competitive global society.

Educational Leadership

Throughout American history, education has served as a critical cornerstone in the building of a great nation. Much of America's success can be attributed to its past educational philosophies. Many people mistake educational reform efforts as an attack on these venerable practices and find difficulty in criticizing a system that has played a pivotal role in undergirding the "American century" (cf. Cremin, 1961). Such issues may cloud the public perception of need for reform, but it does not remove education from the reality of global change today and the urgent necessity to respond accordingly. Real change is needed at various levels of public education, but the net result must bring significant impact right to the classroom. Never before has America's public education relied more heavily on the nation's principals to ensure that every child achieves at high levels and meets tough new state and federal mandates (Owings, Kaplan, & Nunnery, 2005, p. 99).

The 1980s brought a surge of interest in educational leadership. During this period the number of empirical investigations into principal effectiveness increased significantly, while prior to 1980 relatively few studies of administrator effects or impact were conducted. Research reviews of the period encouraged a focus on the effects of principal leadership (Hallinger & Heck, 1998). Twenty-five years of school effectiveness studies reliably construe that successful schools invariably have dynamic, knowledgeable, and focused leaders (Owings et al., 2005, p. 99).

A noted weakness of this research era is the lack of attention to the means by which principal leadership appears to influence the school and its outcomes for students (Hallinger & Heck, 1998, p. 159). Particularly important to the current research study is the investigation of mediated effects as Kentucky principals impact accountability scores

through school leadership, curriculum, and instruction. Because the principal cannot do the actual teaching, leadership contributions lean heavily upon mediation by other people, events, and organizational factors such as teacher commitment, instructional practices, or school culture (Leithwood, 1994).

Instructional Leadership

Much of the research related to principal effectiveness throughout the 1980s conceptualized the role in terms of instructional leadership (Hallinger & Heck, 1998, p. 169). Effective principals were viewed in terms of their capacity to focus staff on the school's academic improvement, narrowing the attention of staff, parents, and students to a limited range of activity (p. 172). In response to this research, reform initiatives of the early 1990s often emphasized the principal's responsibility for instructional leadership. This notion also turned into an important piece of the accountability model as principals shouldered more of the burden for school success.

Hallinger and Heck (1998) suggest that mediated effects studies offer concrete indications of possible means through which leadership may achieve an impact on the school's outcomes and effectiveness. As Hallinger and Heck (p. 167) note, the bulk of the research indicates that principals do make an important difference in school effectiveness. Over time, a pattern of increasing sophistication in the research was noted. The evidence that principals exercise a measurable though indirect effect on school effectiveness and student achievement is supported. Based on such research findings as well as personal beliefs, reformers have turned their attention to principals as a key player in achieving new educational goals.

Hallinger and Heck (1998) further indicate that direct-effects studies offer little contribution to our understanding of questions concerning either if or how leadership

influences student outcomes. The results of such studies of leadership are surprisingly clear. A finding of no significant relationships has been most common, with occasional findings of mixed or weak effects (Hallinger & Heck, p. 166). Researchers adopting this model have been unable to produce sound or consistent evidence of leadership effects on student outcomes. Several studies reveal the weakness of direct-effect studies (e.g., Braughton & Riley, 1991; Cantu, 1994; Cheng, 1994; Krug, 1986; O'Day, 1983; van de Grift, 1987--all cited in Hallinger & Heck). These mediated-effects studies yielded more consistent findings than did the direct-effects studies (p. 183). Recent literature has demonstrated a tendency to explore leadership as a distributed variable, not simply assuming that it resides primarily in the person or is enacted only through the behavior of the principal (Hallinger & Heck, p. 187).

The heavy influence of mediating factors increases the difficulty in establishing quantitative characteristics of effective school leaders. In general, research results support the belief that principals exercise a measurable, though indirect effect on school effectiveness and student achievement. But studies have yet to resolve more important theoretical and practical issues entailed in resolving the principal's role in contributing to school effectiveness (Hallinger & Heck, 1998). The means by which principals achieve an impact on school outcomes as well as the interplay with contextual forces that influence the exercise of school leadership are still not well understood.

Specifically, principals control key factors affecting a school's instructional quality, including attracting, selecting, and retaining outstanding teachers; working with the school community to establish a common mission, instructional vision, and goals; creating a school culture grounded in collaboration and high expectations; facilitating continuous instructional improvement by orchestrating professional development; finding

fair, effective ways to improve or remove low performing teachers; and producing high measured student academic results aligned with state standards (Owings et al., 2005, p. 100). Principals who are instructional leaders successfully retain quality teachers and gain their commitment to student attainment (Owings et al., p. 115). The kind of change needed to achieve reform goals requires new knowledge, the larger part of which must be organized around instructional practice.

Reflecting the reality that all of these instructionally related behaviors required principals to effect changes in staff, i.e., those who work directly with the students, leadership models in the 1990s shifted more toward empowerment, shared leadership, and organizational learning (Hallinger & Heck, 1998, p. 169). The leadership role was increasingly viewed as changing the organization's normative structure. The focus of leadership began to shift away from more narrow concepts, such as instructional leadership, and transformational leadership became more popular. For example, Silins (cited in Hallinger & Heck, p. 174) determined that transformational leadership (actions aimed at providing support, challenging work, and sense of vision and mission) produced significant effects on a variety of teacher-perceived reform processes as well as on school, program, and student outcomes.

The Need for Instructional Leadership

Despite this gradual shift toward the broader emphasis on transforming schools, and concomitantly, attention to the mediated effects of principals (Hallinger & Heck, 1998), it should be remembered that under the pressures for accountability, what is to be “transformed” is an absolute focus on value-added increases in achievement, for *all* students. Consistent with this, Kentucky continues to place a strong emphasis on the principal's instructional leadership capacity.

Instructional Leadership in Kentucky

Kentucky is one of several states which has adopted the ISLLC standards for school leadership. The ISLLC standards are premised on the centrality of student learning as the measure of educational success (Lashway, 2002, p. 2). Consistent with the larger movement toward transformational leadership, these ISLLC standards certainly include instructional leadership but are considerably broader than traditional instructionally related skills (Owings et al., 2005). Traditionally, principals qualified as instructional leaders simply by paying attention to instruction: setting curricular goals, monitoring lesson plans, and evaluating teachers. Current expectations require immersion in the “core technology” of teaching and learning, use of data in decision-making, and alignment of staff development with student learning needs (Lashway).

Despite the recognition that leaders have a broad range of responsibility, in Kentucky’s high-stakes accountability arena, goals and standards clearly focus on instructional leadership. Kentucky goals address what leaders need to know and be able to do to support teachers and students in a high performing school (KDE, 2006b). In fact, legislative action vests principals with the responsibility for making instructional decisions that support teaching and learning (KDE, p. 4). In effect, Kentucky principals are required to perform a balancing act: recognizing the need for school transformation through their mediated (indirect) effects on the actions, beliefs, and climate of faculty and staff, concomitant with ISLLC standards, even as they prioritize their leadership efforts on instruction.

This emphasis on instruction is hardly misplaced. For all of Kentucky’s reforms designed to inspire instructional leadership among administrators, the classroom teacher is perhaps the most significant instructional link. Instructionally, the “rubber meets the road”

in the classroom. Kentucky's goal of Proficiency by 2014 is largely student/school oriented, that is, to deliver a successful product of public schooling. One rarely hears of all Kentucky *teachers* reaching proficiency by 2014. Actually, for schools/students to reach the 2014 benchmark it would be prudent for students to have been exposed to proficient (to use a Kentucky term for high-quality instruction) instruction during their entire school experience. That is to say, proficient instruction should have begun for kindergarten students in the year 2000, continuing through the following years; then, as high school seniors, graduation with a level of Proficient becomes a possibility in 2014.

But the reality for instructional leaders is that proficient instruction is not the norm in America's classrooms. Weiss and Pasley (2004) report only 15 percent of K-12 mathematics and science lessons as high in quality; 27 percent were medium, and 59 percent were low. By their guidelines for high-quality instruction, fewer than one in five lessons were intellectually rigorous, included effective teacher questioning, or guided students appropriately in making sense of the lesson's content (Weiss & Pasley, 2004, p. 25). Adding to the all too common "the rich get richer," in some areas of instruction, rural schools tended to be even lower in quality, with similar deficits for classes with high percentages of minority students (cf. Boyd, Lankford, Loeb, & Wychoff, 2003; Darling-Hammond, 2004; Darling-Hammond & Sykes, 2003).

Jackson (1990) suggested that few recommended actions of reform are actually practiced in the schools, particularly so for those that would affect classroom teaching and learning. Morgendollar (1993) argues that change in instructional practices in schools has moved forward far more slowly than changes such as teams and schools-within-schools, which are external to actual instruction. Cuban (1984, 1990) has noted the historical resistance to changing traditional forms of instruction. Given this reality, data about

instructional change are needed to inform policy and practice. Yet the research on Kentucky reform efforts parallels the absence of change at the instructional level, i.e., extant studies of the effects of accountability at the school or student level are almost exclusively focused on factors external to the classroom.

A complete review of the research on Kentucky reform is beyond the scope of this study (see Pankratz & Petrosko, 2000; Petrosko & Lindle, 2000), but several recent studies reflect this tendency. For example, Luvisi (2000) examined the relationship between the structure of the Primary Program and accountability outcomes. Similarly Lumsden (1999) investigated school outcomes of declining secondary schools based on the effective schools correlates, but these school characteristics focus on the overall learning climate (the discipline factor was strongest). A study by Shutt (2004) found that school culture had a positive effect on outcomes. But none of these studies examined classroom behavior.

More broadly, several studies have looked at the effects of demographic factors on accountability outcomes (e.g., Guskey, 1997; Moore, 2003; Roeder, 1999, 2000, 2001); all of these demonstrated the deep and abiding negative effect of poverty and other at-risk conditions, despite evidence that the overall level of achievement in Kentucky has risen precipitously (cf. Education Trust, 2001; National Assessment of Educational Progress [NAEP], 2003; Poggio, 2000; Prichard Committee on Academic Excellence, 1999). These studies suggest that progress on the excellence front has been significant, despite the pessimism of scholars on the prospects of “scaling up” the success of individual schools or selected programs in specific locales (cf. Stringfield & Datnow, 1998, 2002). Yet similar progress on closing achievement gaps or eliminating the effects of socio-demographic factors on accountability outcomes has simply not occurred, suggesting the greater intransigence of the equity dimension to the best efforts of educators and policy makers

(see Miller & Moore, 2006).

The accountability study that comes closest to examining instructional effects directly is the Ennis (2002) analysis of science accountability for middle schools (seventh grade). Utilizing statewide data, Ennis investigated the effect of seven instructional strategies on both student science scores and school level change scores; the primary findings were that inquiry-based instruction had positive effects for both students and schools; traditional instruction (texts and work sheets) had a positive effect at the individual level but no effect at the school level; and computers had a *negative* impact at both levels. While the computer effect was the strongest (the more computers were utilized, the worse the science scores), none of these factors explained much of the variance in achievement. Perhaps one reason for this is that even this study did not examine classroom instruction directly, instead looking at students' perceptions of teachers' instructional behaviors.

Thus, the literature confirms the absence of Kentucky reform studies that investigate the relationship between leadership, instruction, and curriculum. Instructional leaders in Kentucky and elsewhere across America need to understand instructional influences as a precursor to improving curriculum and instruction. This research looks for the degree to which Kentucky principals, as instructional leaders in the context of standards accountability reform, affect student outcomes. Are they able to foster the vision teachers need to guide the design and delivery of high-quality instruction? To meet goals expecting *all* students to perform at high levels, as does Kentucky (and NCLB), it is reasonable to expect that *all* students receive high-quality instruction, regardless of school location or demographic conditions.

The Standards and Accountability Movement

Standards-based reform shifted the states' responsibility to setting goals and monitoring achievement while the responsibility for providing the ways and means to reach those goals fell to the local level (Fuhrman, 2001). The new standards established expectations that leaders have the technical expertise and content understanding necessary to meet these challenges. This implies knowledge about specific aspects of schooling and skill in performing these valued functions (Leithwood et al., 1992, p. 7). Leaders must be willing and able to work continuously on mastering the technical core, i.e., the fundamentals of curriculum and instruction.

Forty-nine states have developed statewide academic standards in at least some subjects and fifty states test student learning in some way. Over half of these states, including Kentucky, hold schools responsible for results either by rating the performance of all schools or by identifying low performing schools (Roeder, 2001). To close the accountability loop, tests would be directly aligned to standards; be reliable, valid, and fair; have a clear purpose; be operationally feasible; and be useful for school improvement by showing each school how its students are performing and where its instructional strengths and weaknesses are (Lashway, 1999a, p. 3). Such lofty goals for testing are no small order for test developers and/or school leaders.

During the 1990s, virtually every state reengineered accountability systems, not only setting more rigorous expectations, but also changing the focus from inputs to results (Lashway, 1999b, p. 2). The Southern Regional Education Board (1998) identified five essential elements in today's accountability systems. Rigorous content standards are established; student progress is tested; professional development is aligned with standards and test results; results are publicly reported; and results lead to rewards, sanctions, and targeted assistance (cf. Lashway, 1999b, p. 2). Performance-based accountability systems,

now in operation in varying forms across much of America, theorize that measuring performance and coupling it to rewards and sanctions will cause schools and staff to perform at higher levels (Elmore & Fuhrman, 2001). Many of the new systems are works in progress and frameworks vary from state to state (Mathers, 1999). The long-term impact on student achievement is still unclear (Lashway, 1999b, p. 3).

New accountability systems imply that systemic assessment of school performance based on clearly identified standards will lead to school improvement (Lashway, 1999a, p.

2). Lashway identifies a number of challenges presented by the current accountability movement:

1. Mobilizing human and fiscal resources to reach standards that are not just higher but more sophisticated;
2. Avoiding unintended side effects, such as the tendency of assessment to drive non-tested content out of the curriculum;
3. Managing public perceptions when test scores are published with little explanatory context;
4. Maintaining teacher morale in schools identified as low-achieving;
5. Ensuring equity for students with special needs or from disadvantaged backgrounds. (p. 2)

This accountability movement has intensified pressure at the school level to meet established goals, but questions remain as to the actual intent of reform and ramifications for leadership practice. The intention of reform may be to bring needed change to schools. However, schools may react to mandates in a variety of ways based upon the complex peculiarities that comprise diverse school settings. Depending on the alignment of external demands with internal expectations, a school staff may embrace, reject, or selectively adopt state imposed standards (Lashway, 1999b).

Traditional accountability processes did not focus on the principal's role in

improving teaching and learning. Instead the principal was evaluated as a middle manager in satisfying teachers, board personnel, and community stakeholders. The more recent focus on leadership for student learning promises to improve the principalship provided that accountability systems are fair as well as rigorous (IEL, 2000, p. 15). But some systems fall short of fairness, sometimes focusing too narrowly on student scores on a single standardized test and at other times focusing on factors (such as attendance rates) over which principals may have little influence.

Accountability related rewards and sanctions vary from financial incentives and public recognition to media shame or the threat of school closure. The new approaches focus on performance and other outputs and place the burden of accountability on schools (Elmore & Fuhrman, 2001). Accountability is a significant force, causing normative perceptions of principal leadership to evolve rapidly in response to new environmental demands. When schools encounter difficult times, it is commonplace to look to principals for solutions. But high-stakes, standards driven accountability systems pose a new set of problems for school leaders (Lashway, 1999a).

This can be particularly so for disadvantaged schools. Some schools simply may not have the resources needed to achieve goals, and there are considerable indications that the poorest schools tend to be saddled with less effective principals and teachers (Owings et al., 2005). Capacity for reform is seldom considered in accountability formulas, and not enough is being done to assist schools in this area (Elmore & Fuhrman, 2001).

With the emphasis upon improvement so pronounced under the standards/accountability movement, professional development takes on special significance. Meeting value-added goals requires well-coordinated programs that are keyed to the standards and assessments, focused on student achievement, and responsive

to school needs. Most important, these changes must be accessible to teachers--and well enough funded to provide staff the opportunity not only for exposure to new ideas but also the opportunity to learn and practice the concomitant skills to a level that represents significant implementation. Attention and investment are often heavily loaded on the development side, failing to acknowledge that implementation requires an equal investment of time and money (Hall & Hord, 2001, p. 7).

Responsibility for ensuring that professional development meets these rigorous standards requires a more nuanced form of leadership (Lashway, 1999a, p. 3). Principals now must maintain a focus on improvement while still satisfying the relentless everyday demands of constituents (p. 3). Bringing such sophistication to the principalship may require considerable structural change in addition to establishing standards. Knowing and being able to use effective leadership skills are key elements in helping teachers develop programs and practices that work for children (Achilles & Price, 2001).

Leadership Standards

Leaders must have the ability to develop and empower others. Technical expertise and the ability to inspire represent two distinct means for influencing others, and principals must be prepared to employ these powers (Leithwood et al., 1992, p. 8). In the current standards-based accountability movement, policy makers, typically in consultation with professional associations, have put into place standards that are intended to represent the guiding path for students, teachers, and the public. Leaders need to exhibit attitudes and actions that serve as a point of reference for employees struggling to meet these higher standards. This includes both setting expectations for attainment and providing support for implementation (Pritchett & Pound, 1993, p. 30).

With these heightened expectations, leaders needed guidelines for how to realize

these new goals. In that respect, the decade of the nineties saw the culmination of major steps in the standards movement. A number of states and organizations representing accrediting agencies and professional associations joined together in an attempt to define standards for school and educational leadership. Developed under the aegis of the Council of Chief State School Officers in August, 1994, and fueled by contributions of the 24 member states, a generous foundational grant from The Pew Charitable Trusts, and assistance from the Danforth Foundation and the National Policy Board for Educational Administration (NPBEA), the Interstate School Leaders Licensure Consortium (ISLLC) represented a major step in the creation of a respected set of national standards for educational administration (Council of Chief State School Officers, 1996).

Seven principles helped guide the work:

1. Standards should reflect the centrality of student learning.
2. Standards should acknowledge the changing role of the school leader.
3. Standards should recognize the collaborative nature of school leadership.
4. Standards should be high, upgrading the quality of the profession.
5. Standards should inform performance-based systems of assessment and evaluation for school leaders.
6. Standards should be integrated and coherent.
7. Standards should be predicated on the concepts of access, opportunity, and empowerment for all members of the school community. (Council of Chief State School Officers, 1996, p. 6)

The ISLLC document itself contained six standards, each with specific indicators identifying the goals in three distinct aspects of leadership: knowledge, dispositions, and performances. The six ISLLC Standards focus on the essential aspects of leadership--defined in relation to student success--and are designed to help transform the profession of

educational administration and the roles of school administrators. Eventually these standards were to lead to the development of licensure tests for school administrators and constitute current guidelines for leadership development in Kentucky. The ISLLC Standards are listed in Appendix B.

By 2002, thirty-five states had incorporated the ISLLC standards into their principal licensure policy, and NCATE (National Council on Accreditation for Teacher Education) had adopted these standards as required components for accrediting principal preparation programs. In this same year the Educational Testing Service (ETS) developed and began using the complementary School Leaders Licensure Assessment (SLLA) to assess beginning principal candidates (Owings et al., 2005).

Although widely accepted, some critics point out certain weaknesses in the ISLLC standards. Achilles and Price (2001) argue they lack enough specificity or operational guidance to help school leaders use them for action. Others claim the standards are not anchored in a professional knowledge base or rigorous research (English, 2000; Hale & Moorman, 2003). Yet the criticisms noted have not overshadowed a clear empirical relationship between the principal's mastery of the ISLLC standards and a healthy and high-achieving school (Owings et al., p. 115).

The Kentucky Education Reform Act

Kentucky legislated sweeping educational reform in 1990. The publicized intent of KERA was to bring a certain level of funding equity, academic achievement, and accountability to all schools. Sanctions and rewards added powerful teeth to the movement. Sanctions would pressure low performing schools to improve and rewards would inspire successful schools to further achievement. Long-term ramifications of the initiative were to a degree unforeseen and uncertain. Schools were given achievement

goals and baselines were established from which to measure continuing progress toward proficiency by 2014. Principals and staff were expected to determine needs and devise activities at the school level to meet goals.

In practice, Kentucky, like many states, has never relied on sanctions and rewards alone as a means to reform public education. School administrators and educators need leadership, knowledge, resources, and some assistance to sustain continuous progress. Kentucky supports capacity-building directly, by promoting through grants and other means, programs such as early childhood development, literacy, career and technical education, community engagement, student and family support, and school technology (KDE, 2004b, p. 174).

Accountability has forced school leaders, principals, and other responsible staff to become deeply engaged in instruction, curriculum, and reviewing data so that resources can be directed at improved learning for all students. This is actually a paradigm shift for principals, compared to previous expectations for managing stability and maintaining discipline. Even 15 years into reform, principals continue to struggle with this new leadership role and concomitant accountability.

The Kentucky Education Reform Act (KERA) rattled tradition (Foster, 1999; Steffy, 1993). With the reform built around accountability for student performance and improvement, KERA was not based on the simple belief that the educational system needed repairing; rather, the entire edifice would need to be rebuilt to match the drastic change needed if educators were to prepare the state's children for productive lives in the 21st century (KDE, 1993, p. 15). KERA extensively changed the laws and requirements of Kentucky schools in the areas of finance, governance, and curriculum, placing the state at the forefront of educational reform (Moore, 2003, p. 50). This was a new twist for

Kentucky principals more accustomed to managing schools than student learning. Such fundamental change confronted administrators with a new role, added duties, and a shift in principal expectations by stakeholders at every level.

Kentucky school leaders generally realized that new ways of doing things would be required to address new learning goals and learner outcomes but finding and institutionalizing appropriate innovations would prove to be quite challenging. Specific models or methods to achieve objectives were not identified in Kentucky's reform package. Reformers expected that accountability would cause schools to find innovative ways to meet goals. The focus on outcomes would cause school personnel to rethink norms and publicized school scores would brighten the spotlight on school performance. Pressure immediately began to mount among school leaders to re-focus energy and develop new school strategies.

These new concepts changed the expectations of principal leadership in Kentucky. Many of the new processes were open-ended; schools and school leaders had previously operated with more structured policy. This confusion raised many questions and fostered opposition in certain areas. State leaders quickly realized that a new type of school administrator would be needed to guide reform policy. Kentucky's new value-added accountability system ended the traditional assumptions that schools are stasis organizations based on the "quality" of students, a euphemism for class and race (Miller, 1992). Instead, Kentucky now expected continuous upward movement from an initial baseline score and *all* students would be included in improvement measures.

Accountability in Kentucky Education

Pressure from Kentucky's high-stakes accountability plays a key role in changing perspectives on principal leadership in Kentucky. In fact, accountability may be more of a

driving force than stated goals or standards. Kentucky's reform expects schools to make continuous improvement toward established goals. To be identified as successful, schools must raise accountability scores in each successive testing cycle, reaching a goal of proficient by 2014 (100 on Kentucky's Accountability Index). Principals must continually seek innovative means of inspiring the school community to rise to an ever-increasing threshold of learning.

Kentucky demands that student and school assessment data guide school decisions. Schools are required to develop transformation plans (Comprehensive School Improvement Plan, CSIP) that detail improvement efforts. Causal indicators and evidence of need are to support each action identified in the plan. Continuous assessment of school activities and supporting data are necessary actions for this transformation. Leadership is clearly important in this process. For example, Owings et al. (2005, p. 100) demonstrate that effective principals can mean the difference between scoring at the 50th or 60th percentile on a given achievement test.

However, it may be well to note here that as schools move up the achievement scale from their baseline toward 100 (Proficient), the achievement environment changes. Improvement strategies that produced significant score gain near their starting point are not likely to produce equal gains at higher points along the scale. Addressing fundamental and easily identified organizational needs can get most schools well out of the starting gate but strategies must ratchet upward as schools get closer to the proficient goal.

Thus, at the higher end of the scale fundamental practices must remain sound and be supplemented by more efficacious, more focused, and more individualized strategies. A large number of small refinements may be needed along with a deeper analysis of empirical data to align these strategies with multiple improvement targets. School leaders

and staff must, therefore, evolve with respect to their reform/improvement capabilities as they slide up the achievement goal line.

Thus, Kentucky accountability implies that schools/principals/staff have the power, skill, and resources to enable all children to reach high standards, no matter what the level of the school. In fact, all of these are in limited supply at the local level, particularly for at-risk students. Smith (1995) explained that the move to standards-based assessments would likely result in an increase in the achievement gap because advantaged children are more likely to have access to the well-trained teachers and other resources that are needed to provide the level of curriculum and instruction that equates to high standards.

A dilemma seems to confront every facet of reform when inadequate resources cause educators to rob from Peter to pay Paul. Few protections are in place to guard against more affluent districts from cannibalizing poor schools as key staff in the success of poorer schools are all too often siphoned away to more attractive locations (Owings et al., 2005). Staff and programs turn over for organizational rather than educational reasons with little regard for effects on student learning (Murphy, 2004, p. 89). This practice in effect results over time in lower quality staff working in lower performing schools. Having low-quality staff (and/or leadership) in high-needs schools is an equity issue that needs further attention.

The Kentucky system assumes that schools are capable of eliminating socioeconomic effects and that cries for help along these lines by school administrators are just an excuse for poor administrative performance. Yet the notion that “all children can learn at higher levels” quietly overlooks an abundance of research on the significant influence of background and social influence on student achievement (cf. Miller, 1995;

Portes, 2005; Rothstein, 2004; Wilson, 1987). Generally poorer schools continue to show the least improvement on Accountability Index scores in Kentucky (Petrosko, 2000; Roeder, 2001) indicating a need for more adjustment in reform processes.

Several obvious needs exist in poor schools. For example, Portes (1996) and Rothstein (2004) both note the importance of the family environment, including stable home life and expanded pre-school support for families and students. In addition, if schools that serve disadvantaged students are to function effectively, a variety of factors are essential, including but not limited to high quality staff, high quality individualized instruction, lower class size, and high quality professional development that is on-site, on-going, and applied in the classroom. As well, professional staff need to be more sensitive to the culture and learning style of students who come from backgrounds different from the middle class, white subculture that schools reflect.

Since the implementation of Kentucky reform in 1990, schools have struggled with assessment. Accountability keyed to the CATS (Commonwealth Accountability Testing System) results often overshadows other means of assessment and initiatives deemed very useful to local schools. Standards-based reform models give little or no attention to the above conditions when identical goals are set in stone and timelines for achievement are fixed for all schools. The explicit dilemma of accountability can be framed as how to do something about the above conditions while at the same time recognizing that adjusting scores to accommodate these conditions simply lowers expectations for certain populations. Thus, the issue of assessment continues to be very controversial. Pressure for results can lead schools to an obsessive focus on test scores. Excessive emphasis on testing can lead to low teacher morale, a narrowed curricular focus, a diminished sense of professionalism among teachers, and unethical practices

(McCary, Peel, & McColskey, 1997; Sloan & Kelley, 2003).

Financial rewards based on assessment results have been used inconsistently in Kentucky, generating some turmoil at the school level. Methods of distributing rewards and permissible use of reward funds were revised in the year 2000. In 2004 state budget issues ended funding for rewards. This was a discouraging reverse in reform, especially for schools that had worked hard to qualify for rewards. The real world rewards results (Pritchett & Pound, 1993, p. 12) and successful efforts are worthy of rewards. Financial rewards have since succumbed to budget cuts while accountability and consequences have intensified pressure on school staff and leadership to achieve goals (the practice was discontinued in 2003; schools were not rewarded in 2004) (KDE, 2004b, p.175). It is worth noting here that although Kentucky has presently shelved its financial reward policy, sanctions are still firmly in place.

Kentucky Standards

Kentucky reform standards require that all teaching and learning tasks address established learning goals and learner outcomes. These identify what students need to be successful in the world of the future. Thus, educators in Kentucky design and implement instruction and assess learning that develops students' abilities to:

1. Use basic communication and mathematics skills for the purposes and situations they will encounter throughout their lives.
2. Apply core concepts and principles from mathematics, the sciences, the arts, the humanities, social studies, practical living studies, and vocational studies to what they will encounter throughout their lives.
3. Become self-sufficient individuals.
4. Become responsible members of a family, work group, or community, including demonstrating effectiveness in community service.
5. Think and solve problems in school situations and in a variety of situations

they will encounter in life.

6. Connect and integrate experiences and new knowledge from all subject matter fields with what they have previously learned and build on past learning experiences to acquire new information through various media sources. (KDE, 2006d, p. 1)

Over time, some degree of fine-tuning the performance assessments affected both how achievement is measured and how progress toward goals is defined, but high-stakes accountability remains firmly entrenched in on-going reform. The state has modified the original performance assessment, the Kentucky Instructional Results Information System (KIRIS), replacing it with the more traditional Commonwealth Accountability Testing System (CATS). But the fundamental notion of continuous improvement based on content standards still underlies the accountability model. The assessment process continues to evolve in Kentucky, affected by federal legislation and an on-going effort to improve student achievement. Several changes are planned for the 2006-2007 school year including the weighted values of certain content areas, as well as grade level and time of year for administering certain portions of the assessment

Eventually administrator standards were also identified and formally adopted. However, accountability for leadership continued to be vague. Among other issues, there are questions surrounding the fairness of principal responsibility for assessment scores without the decision-making authority to effect structural change.

Leadership Standards in Kentucky

In 1994, Kentucky amended its reform effort by adopting standards and indicators for school administrators. These standards represented essential knowledge and skills necessary for effective and efficient leadership in restructuring schools, as created by the framework of the Kentucky Education Reform Act and as envisioned for the 21st century

(KDE, 1994). The standards were adopted by The Kentucky Education Professional Standards Board (EPSB) and were commonly referred to as the EPSB Standards. Specific indicators within standards reflected a belief that new administrators need both knowledge and the ability to apply that understanding in the context of realistic school situations.

Kentucky's EPSB Standards consists of three sections (KDE, 1994). Standard 1 described the administrator as the instructional leader who guides, facilitates, and supports the curriculum, instruction, and assessment. Thirteen indicators specified that standard. Standard 2 stated that the principal practices positive, promotional, and pro-active communication strategies (oral and written) for effective parent/community involvement to improve the learning environment for all students. Thirteen indicators defined the parameters of this standard. Standard 3 declared the principal to be the organizational leader and manager who acts within legal and ethical guidelines to accomplish educational purposes. Sixteen indicators operationalized this standard.

In addition to adopting state level leadership standards in 1994, Kentucky joined the ISLLC consortium. Both Kentucky's original EPSB standards and indicators and the more national ISLLC standards provide a framework for understanding expectations for Kentucky principals. The ISLLC Standards provided additional detail beyond Kentucky's EPSB standards in defining administrative behaviors by including appropriate dispositions or actions in specified standard indicators in addition to knowledge components. Although the Kentucky EPSB standards included interpersonal and technical skills, socio-cultural commitment, and advocacy for children (KDE, 1994), these same themes are expanded under the ISLLC Standards.

In Kentucky, principal certification requires completion of ISLLC's School Leaders Licensure Assessment (SLLA) and currently requires a score of 155 (effective

September 1, 2006, the qualifying score is 165) (Kentucky Education Professional Standards Board, 2006). In addition to the SLLA, principal licensure in Kentucky also requires a minimum score of 85 on the Kentucky Specialty Test of Instructional and Administrative Practices.

Auditing for Accountability

In 1998, Kentucky's General Assembly passed KRS 158.6455. The intent of this legislation was to ensure that schools succeed with all students and receive appropriate consequences in proportion to that success (Division of School Improvement, 2003, p. 8). Section 3 of the statute charged the Kentucky Board of Education to adopt administrative regulations to establish consequences for schools whose assessment index fell below their assistance line. In the long-term accountability system, these consequences are designed to improve teaching and learning and may include a Scholastic Audit and eligibility for Commonwealth School Improvement Funds, along with possible transfer of students to successful schools. Section 4 of this statute directed the Kentucky Board of Education to establish guidelines for conducting scholastic audits. While Kentucky's accountability system is based upon measuring continued improvement toward a long-term goal, and thus has built in monitoring to ensure real and enduring improvement, the Scholastic Audits contributed to this monitoring by focusing on those schools that need assistance the most (KDE, 2006a).

Kentucky's value-added accountability system has generated extensive debate over its efficacy with respect to the twin goals of KERA: (a) significant increases in achievement, and (b) reduction of achievement gaps between at-risk and advantaged students (cf. Miller & Moore, 2006). But regardless of debates about philosophy or implementation, the reality is that Kentucky schools and the principals who lead them are

operating within the context of this high-stakes assessment model. Recognizing this challenge, Kentucky has provided several different sources of assistance for school leaders. One of these is the Scholastic Audit.

On the national level, school auditing is more associated with accrediting processes or financial accountability. The researcher's experience reveals an abundance of literature associated with auditing finances, safety, security, energy, health, and culture but little associated with Kentucky's current concepts of accountability. Auditing a school's academic performance, consistent with accountability goals and guidelines, seems to be unique to Kentucky's reform model. A phone conversation with the director of KDE's Division of Scholastic Assistance indicates that at least 11 other states have expressed some level of interest in Kentucky's Scholastic Audit and Alabama has adopted the Scholastic Audit process with adaptations to their state educational model (personal communication, Barbara Kennedy, January 30, 2007). Kennedy also indicated that Virginia, Oklahoma, and Chicago City Schools have used Kentucky's audit process as a model for developing Scholastic Audit procedures. These external reviews by teams trained by the KDE are correlated with the nine Standards and Indicators for School Improvement (SISI) and are designed to measure a school's compliance with each respective standard.

Standards and Indicators for School Improvement

The Kentucky Board of Education has adopted the *Standards and Indicators for School Improvement* document as the measure of a school's preparedness in meeting its long-term goal of Proficient. The accompanying document, *District Level Performance Descriptions and Glossary for Kentucky's Standards and Indicators for School Improvement* (KDE, 2004a), identifies the responsibility of the instructional leader in

improving the academic performance of students, learning environment, and organizational efficiency of their buildings (KDE, 2006b, p. 9). The document also provides detailed information schools need to answer essential questions about how to create and sustain excellence. It is a reference manual intended to help inform educators as they use the SISI workbook at the local level.

These standards and indicators are touted as a model for student-centered accountability. Nine standards are identified, each one accompanied with five to 16 indicators. Standards 1 through 3 (Curriculum, Classroom Evaluation/Assessment, and Instruction) are grouped together under the auspices of “Academic Performance.” Standards 4 through 6 (School Culture; Student, Family and Community Support; and Professional Growth, Development and Evaluation) are termed “Learning Environment.” Standards 7 through 9 (Leadership; Organizational Structure and Resources; and Comprehensive and Effective Planning) are labeled “Efficiency.” It is the cumulative effect of all the standards that yields whole-school improvement and high student academic achievement (Division of School Improvement, 2003, p. 10).

In addition to providing an overall framework for understanding how the different components of schools fit together for a model of school improvement, the SISI document (KDE, 2004c) is also intended to guide the development of a comprehensive school improvement plan (CSIP). The document provides a framework for determining what elements of a CSIP have been implemented and to what degree. The document is used specifically by audit teams to gather data for a Scholastic Audit but is available to all schools as a planning resource. It may be used at the start of a planning cycle as a diagnostic tool to inform the school team of their current status relative to the standards for school improvement. A completed self-analysis based on the SISI document could be

a critical element of planning the school's goals and objectives for the accountability cycle. The SISI document comes with detailed guidelines for its use at the school level.

The SISI document may also be used for a mid-point review of improvement status. Aspects of the report are to be discussed and updated by the school staff based on the most current evidence. Upon completing the review, all stakeholders should have a clear sense of their progress and how to incorporate appropriate adjustments. At the end of the year or planning cycle, the school team again completes a self-assessment. This last assessment, along with other evidence (test scores, grades, non-cognitive data), is used in a final quality review to evaluate the school's progress in achieving its goals. Stakeholders reflect on the strengths and weaknesses of implementation and focus on identified areas for future planning.

Thus, the SISI document can be thought of as a cumulative formulation among things long known. It is the overall effect of all nine standards taken together in a system that brings about continuous, whole-school improvement (Division of School Improvement, 2003, p. 4). Results are to be derived from exploiting opportunities, in the process of solving problems. Resources can then be effectively allocated to the most decisive opportunities, defined by engaging all stakeholders and by using data appropriately to make decisions.

Of the nine standards listed, only three are engaged in this investigation of Kentucky principals: Curriculum, Instruction, and Leadership. Each of these is examined briefly.

Standard 1, Curriculum

School leaders need to be aware of the many rich and innovative curriculum strategies that can be employed to help students increase learning, without resorting to

narrowing the curriculum. Leaders need to be strong in the face of intense pressure to raise test scores and remember the importance of maintaining an engaging, comprehensive curriculum (Anthes, 2002).

Kentucky schools are expected to develop and implement a curriculum that is rigorous, intentional, and aligned to state and local standards. Kentucky documents (Academic Expectations, Core Content for Assessment, Transformations, and the Program of Studies) are provided to guide curriculum alignment (KDE, 2004c, p. 5). Expectations for students are set forth as the six learning goals of KERA. These goals framed the development of academic expectations that characterize student achievement of goals. All Kentucky students are expected to achieve the goals and academic expectations. The *Program of Studies* for Kentucky schools, grades Primary-12, helps ensure that all students across the commonwealth are provided with common content and have opportunities to learn at a high level. *Core Content for Assessment* represents the content that has been identified as essential for all students to know and represents the content on the state assessment.

Districts are to ensure that curriculum standards are clearly articulated across all school levels. Schools are to maintain this focus on curriculum alignment as students transition through various grade configurations with specific links to continuing education, as well as life and career options. Schools are to have in place a systematic process for monitoring, evaluating, and reviewing the curriculum and must provide access to a common academic core for all students. Kentucky's Scholastic Audit is explicit in identifying a school's effort to ensure these curriculum expectations.

Standard 3, Instruction

A Kentucky school's instructional program must actively engage all students by

using effective, varied, and research-based practices to improve student academic performance (KDE, 2004c, p. 13). Audit teams look for evidence that effective and varied instructional strategies are used in all classrooms. Instructional strategies and learning activities are to be aligned with the district, school, and state learning goals and assessment expectations for student learning. Instructional strategies/activities are to be consistently monitored and aligned with the changing needs of a diverse student population to ensure various learning approaches and learning styles are addressed.

Kentucky teachers are expected to demonstrate the content knowledge necessary to challenge and motivate students to high levels of learning. They must also incorporate the use of technology in their classrooms. Instructional resources must be on hand sufficient to deliver the curriculum effectively. Staffs are to examine and discuss student work collaboratively and use this information to inform their practice. Homework is to be frequent and monitored and tied to instructional practice. These instructional goals specifically frame this instructional audit standard.

Standard 7, Leadership

School instructional decisions should focus on support for teaching and learning, organizational direction, high performance expectations, creating a learning culture, and developing leadership capacity (KDE, 2004c, p.32). Kentucky school leaders are expected to develop and sustain a shared vision. Leadership decisions are to focus on student academic performance and must be data-driven and collaborative. Administrators must have a growth plan focused on the development of effective leadership skills. The school leadership team is expected to disaggregate data for use in meeting the needs of a diverse population, communicate the information to school staff, and incorporate the data systematically into the school's progress plan.

Leadership is responsible for ensuring all instructional staff have access to curriculum related materials and the training necessary to use curricular and data resources relating to the learning goals for Kentucky public schools. Time must be protected and allocated to focus on curricular and instructional issues. Leaders plan and allocate resources, monitor progress, provide the organizational infrastructure, and remove barriers in order to sustain continuous school improvement. Organizational policy and the resource infrastructure necessary for the implementation and maintenance of a safe and effective learning environment are a provision of school leadership.

In addition to working with the faculty directly on matters of instruction and curriculum, the principal also has responsibility for school governance. In Kentucky schools those decisions are vested in the School Based Decision Making (SBDM) council. School leadership provides a process for the development and the implementation of council policy based on anticipated needs. One challenge is to ensure that the SBDM does not spend all its time and energy directed to matters that are political or managerial. If the SBDM is to have an intentional focus on student academic performance, all other functions must be seen as processes that *support* the teaching and learning in the classrooms rather than being ends in themselves. Specifically, the principal, as leader of the SBDM, must demonstrate leadership skills in the areas of academic performance, learning environment, and efficiency.

Based on expectations for working with faculty and staff in the areas of curriculum and instruction, as well as the responsibility for ensuring that the SBDM functions primarily to support and prioritize academic achievement, Kentucky has well documented its intent that principals act as instructional leaders. In Kentucky, an instructional leader is defined as an employee of the public schools of the Commonwealth employed as a

principal, assistant principal, supervisor of instruction, guidance counselor, director of special education, or other administrative position deemed by the Education Professional Standards Board to require an administrative certificate (KDE, 2006b, p. 3). Kentucky State Board of Education Goals and Objectives identify “every principal an instructional leader” (KDE, 2006b, p. 8). Principals are required to participate in 21 hours of training annually in approved instructional leadership programs. The content of approved instructional leadership programs must address the competencies for leadership identified in the SISI document and/or the ISLLC standards for school leaders (KDE, 2006b, p. 13).

Kentucky School Audits

Kentucky’s Scholastic Audit parallels the *Standards and Indicators for School Improvement* document, representing the set of common standards upon which recommendations for assistance are to be based (Division of School Improvement, 2003, pp. 8-9). These standards and indicators form the framework for Kentucky Scholastic Audits. Audit teams rate school performance on each of the standard indicators. Indicators are rated on a four-point scale based on interviews, observations, and material evidence. Scores range from “Little or no development and implementation” (1) to “Exemplary level of development and implementation” (4). The actual audit document, *Standards and Indicators for School Improvement* (KDE, 2004d), is available to all schools and may be used in any fashion, to guide school decision-making, to guide a self-review, to align accountability goals, or to prepare for an outside scholastic audit.

Schools are encouraged to use the SISI document and audit process to plan and monitor strategies and activities with a detailed focus on whole-school improvement. Schools may voluntarily invite an outside audit using this same tool for evaluation and improvement. Schools failing to meet progress standards may be *required* to accept a state

audit; again this same tool is used in the school evaluation. Kentucky schools are tested annually, near the end of the school year (late spring). Assessment results are available to schools and the public the following fall (approximately September 15th). Required Scholastic Audits, based on accountability scores, follow the release of assessment results.

Two years of data are combined to form both the baseline and the growth indices for Kentucky schools. Combining two years of data addresses some of the stability issues related to estimating the achievement for small schools (KDE, 2002). The goal for all schools is to reach Proficiency, or a growth index of 100, by 2014. Interim targets are established for each two-year Accountability Cycle representing a requirement that achievement improve by a set amount each year.

Audit Procedures

The Kentucky Department of Education established guidelines for audit teams, including a process for appointing and training team members, reviewing a school's learning environment, efficiency, and academic performance of students; evaluating each certified staff member assigned to the school (only certified members of the audit team shall evaluate personnel); and reporting to the Kentucky Board of Education about the appropriateness of a school's classification and the assistance required to improve teaching and learning in the audited school. Scholastic Audits performed by state, regional, and local district personnel are thorough and provide audited schools with information on over 80 indicators related to school success (KDE, 2006a). Scholastic Audit teams are comprised of a parent, teacher, school administrator, district administrator, university faculty member, and a Highly Skilled Educator (Division of School Improvement, 2003, p. 9).

Kentucky schools with an accountability score placing them below the assistance

line are divided into three categories. Schools with scores that place them in the lowest one-third are classified as Level 3. These schools automatically receive a state Scholastic Audit. Schools with scores that place them in the middle third are classified as Level 2 and receive a lesser audit version known as a Scholastic Review. The same audit procedure is used but the audit team is reduced to two representatives from the regional service center and two to four representatives from the school's district. Schools in the upper third are classified as Level 1 and most conduct a self-review using the SISI document. Successful schools are defined as having an Accountability Index that met or exceeded their goal (Division of School Improvement, 2003, p. 9).

Audit teams look for specific traits that are seen as hallmarks of good schools. Teams spend a week in each school, culminating the process with a report to school staff. Findings of the report are supported with specific evidence, and the team shares ideas for how the school can improve (Alan, 2004, p. 6). Regulations charge audit teams to make recommendations on the following: strategies to improve teaching and learning for incorporation into the school's improvement plan (CSIP); the roles and responsibilities of the SBDM council in the critical instructional areas; the effectiveness of the principal as the instructional leader in the three areas of the audit; certified staff needing further evaluation; assistance and resources needed to revise the school's CSIP; and priorities and strategies which the school or district may adopt to support the improvement effort.

Summing up, audit results are used to help schools and districts accomplish a number of important goals (Division of School Improvement, 2003, p. 2):

1. determine strengths and weaknesses of a newly implemented program or plan;
2. identify problems early in the implementation process and address them through a continuous improvement model;

3. document early successes as positive feedback to school staffs and as supportive evidence for the continuance of the program or plan;
4. enable school staffs to base improvement planning on objective data; and
5. formalize school accountability for the success of their comprehensive program or plan.

Some sense of the effectiveness of this process is provided by empirical outcomes. Since 1998, 95.7% of the Level 3 schools supported by state assistance have moved out of Level 3 classification by meeting or exceeding their goals (KDE, 2006c). The average gain in CATS scores at supported schools has always exceeded the average gain of all schools.

KDE Audit Results

In Kentucky, it is presumed that all children can learn at high levels, given adequate time, opportunity, and support. Lessons from successful schools are presumed to inform efforts to help schools that are struggling. The Division of School Improvement Audit/Review process enables Kentucky to do that with confidence and precision (Wilhoit, 2003). Audits of successful and struggling schools reveal a complex set of “Leverage Points” that can focus the work of schools toward continuous improvement.

Kentucky’s first report on the audit data provided schools with specifics on how Level 3 assistance schools varied greatly from successful schools. As a result of the 2000-2001 round of audits, 17 indicators were designated as Leverage Points (see Appendix C). After the 2002-2003 audits were completed, the term “Leverage Point” was changed to “Variance Point” to describe more accurately the meaning of the term (KDE, 2004a, p. 8). In this round of audits 27 indicators were identified as Variance Points (see Appendix D). Six Common Variance Points were gleaned from the two rounds of audits (these are listed in Appendix E). In 2005, the state released a new set of 11 points found to be significant/common across all the years of audits (see Appendix F). Identification of such

points is intended to help schools focus improvement efforts.

Schools are encouraged to use high leverage opportunities to focus resources most effectively to improve teaching and learning (KDE, 2004a, p. 21). Relevant to this study and due to the nature of the Common Variance Points, it may be noted that the school principal, as an instructional leader, would be closely involved in any school response to the 17 Variance Points and particularly those six common to both reports. This literature review has revealed little research, outside the KDE, focusing on Kentucky's Standards and Indicators for School Improvement or Kentucky's Scholastic Audit. Allen (2004) reports the usefulness of Kentucky's audits in general but does not venture into a detailed study of Kentucky's audit concepts or audit results. Particularly telling is the lack of quantitative effect sizes in these few studies.

The Kentucky Department of Education has published a summary of these school audit results that is useful in understanding principal effectiveness within the confines of instructional and accountability expectations. Lessons learned or implications of the audit results can be utilized in an effort to improve schools for all Kentucky children. Seven key lessons emerged among high-performing schools. These lessons inform school leadership and are listed in abbreviated form below, based on information from the Division of School Improvement (2003, pp. 23-25).

1. In successful schools there is evidence that adults believe in the capacity of children to learn at high levels.
2. Schools that are more successful have their curriculum more closely aligned with state standards and the staff has knowledge and skill in the use of the standards.
3. Successful schools use multiple evaluation and assessment strategies to monitor and modify instruction to meet student needs and support proficient work. This assessment for instructional improvement is both frequent and continuous.

4. In successful schools there is a relentless focus on student learning. The instructional program in these schools actively engages all students by using effective, varied, and research-based practices to improve student performance.
5. It appears that the more successful schools become, the more likely staffs are to analyze test data and other student work. The information gained from this activity is used when making needed changes to bring about continuous school improvement.
6. Schools that are successful tend to see professional development as an ongoing process rather than a series of unrelated events. Staff development needs are identified through the analysis of student and teacher work for the expressed purpose of improving student achievement. Professional development in successful schools is focused on improving and, if necessary, changing instructional practice. These schools have been successful in carving out time for job-embedded professional development during the course of the school day in the midst of working with students.
7. Successful schools are generally further along in the implementation of the culture, community support, professional development, leadership, school organization and resource allocation standards (SISI Standards 4-8) than they are in the standards of curriculum, assessment, instruction as well as Comprehensive School Improvement Planning (SISI Standards 1, 2, 3, and 9). Leadership of the successful schools encourages discussions among all stakeholders regarding the strengths and weaknesses of the instructional setting and organizational structure. Significant work remains in both successful and assistance schools in the less well-developed Standards 1-3, 9.

In addition to the specific studies by the Kentucky Department of Education, Koger and Thacker (2004) did further analysis on the scholastic audit data. They identified several characteristics that distinguish successful schools from Level 3 schools, performing a detailed analysis of scores on all 88 indicators for audits conducted through June of 2003. They organized schools into three groups for their study (highest fifth Successful Schools, lowest fifth Successful Schools, and Level 3 schools) and investigated only audited elementary schools. A Kruskal-Wallis one-way analysis of variance test was used to identify differences between the three school groups and two-sample Mann-Whitney tests compared any two groups of schools. Results led to the following conclusions:

1. All schools can improve.
2. There are distinct, measurable differences between each of the three school groups.
3. There are areas where successful schools, regardless of their academic indices, have similarities.
4. There are areas where schools with lower academic indices have similarities regardless of their progress toward meeting their goal. (Koger & Thacker, 2004, p. 80)

Beyond these few studies on Kentucky's Scholastic Audit, the general literature on instructional leadership suggests the following conclusions. In reality, principals find their jobs overwhelming in many respects. Widespread demands limit their ability to focus on accountability goals and instructional leadership expectations. Principal influence at the classroom level is not only limited by other obligations and/or expectations. Instructional leadership implies a considerable level of expertise about current innovations and effective practice, all of which may vary among student populations and learning levels. Training and in-depth exposure to the very best classroom instructional practices is limited in the current organizational framework in which Kentucky principals function. Indeed, organizational realities imply that instructional leadership may need augmentation by on-site curriculum/instruction specialists who have the expertise and latitude to provide ongoing support at the classroom level.

Finally, the literature on instructional leadership is essentially conceptual. Many of the empirical studies represent qualitative investigations. Extant quantitative studies do not always present effect sizes. As Hallinger and Heck (1998) emphasize, the evidence for direct effects of principal leadership on achievement related outcomes is weak. In contrast, mediated effects do seem to be consistently reported. The Hallinger and Heck study revealed several paths that begin to describe the means by which principal

leadership influences student learning outcomes. These included school goals, school structure, social networks, people, and organizational culture. In particular, the principal's role in shaping the school's direction through vision, mission, and goals came through in these studies as a primary means of influence. While the state of this research continues to evolve, these variables represent both a reasonable focus for principal practice and for future research into school effectiveness and improvement (Hallinger & Heck, p. 187).

Mediated-effects studies yielded more consistent findings than did the direct effects studies that were popular earlier in the decade. The results of direct-effects studies of leadership impact are surprisingly clear. Hallinger and Heck (1998) cite a number of researchers who have been unable to produce sound or consistent evidence of leadership influence on student outcomes based on this model (e.g., Braughton & Riley, 1991; Cantu, 1994; Cheng, 1994; Krug, 1986; O'Day, 1983; van de Grift, 1987). A finding of no significant relationship has been most common, with occasional findings of mixed or weak effects. In the future, such studies offer little hope as a means of contributing substantially to an understanding of questions concerning either if or how leadership influences student outcomes.

Thus, the general lack of specific quantitative estimates remains problematic and there is a clear need in the field for additional studies. Ideally, such studies will model both direct and indirect influences of leadership behavior. Controls for demographic factors should also be routinely included in such work since ecological context has been demonstrated to affect leadership behavior as well as achievement levels (Hallinger et al., 1996), with both overall and R^2 change effect sizes reported.

Summary

In recent years, virtually every state in America has joined the "Standards and

Accountability” movement, generally resulting in the establishment of rigorous standards to be aligned with high-stakes assessment. Rewards and, to a larger degree, sanctions, add power to the term *high-stakes*. The accountability process varies from state to state and continues to evolve at a rapid pace, pushed by global change. Kentucky is deeply vested in high-stakes accountability reform. Annual assessment results bring significant pressure to perform and consequences for lack of adequate progress are not pleasant, whether due to Kentucky standards and/or NCLB standards. Though no Kentucky school has yet been taken over by the state for performance failure, there is considerable anguish related to low accountability scores. No school can feel good about having to notify parents that as a result of poor performance, their child will be given the opportunity to transfer to a successful school at the district’s expense.

Kentucky’s model for student-centered accountability is framed by a document entitled *Standards and Indicators for School Improvement* (KDE, 2004d). The process is defined by nine standards under the headings of Academic Performance (Standards 1, 2, & 3), Learning Environment (Standards 4, 5, & 6), and Efficiency (Standards 7, 8, & 9). The standards are to be considered together as an integrated whole. Whole-school improvement and high student academic achievement is premised on the cumulative effect of all the standards (Division of School Improvement, 2003, p. 10). Accompanying each of the nine standards is from five to sixteen indicators, specifying school expectations for the respective dimensions of schooling. These standards and indicators form the framework for school planning and school evaluation. Kentucky’s Scholastic Audit is based precisely on these standards and indicators, thereby aligning evaluation with accountability.

The “Standards” movement has encompassed school leaders at the local level, in

particular the role of principals. Redefining the role, in the context of standards and accountability reform led to the cooperative establishment of standards crossing state lines and achieving widespread national acceptance. ISLLC standards focus on the essential aspects of leadership and are designed to help transform the profession of educational administration. These ISLLC standards also frame Kentucky's leadership expectations, are embedded in its accountability model, and are highly visible in the context of local school audits. Yet the influence of leadership standards on actual practice in Kentucky seems to be somewhat unclear at this time.

The interest in school leadership fostered in the 1980s by school effectiveness research continues to evolve amid the standards and accountability movement. A product of the effective schools research, instructional leadership continues to play a pivotal role in leadership expectations even as the ISLLC Standards demand broader transformational leadership for the school. What seems to be required is the ability to transform the culture of the school in such a way that the staff accepts the imperative of improved instructional practice, sufficiently powerful for achieving accountability goals. Ultimately principal responsibility for instructional leadership is an important piece of Kentucky's accountability model.

In Kentucky, instructional leadership is supposed to be practiced so as to be consistent with the nine SISI Standards. Kentucky's principals are expected to lead the development of a Comprehensive School Improvement Plan that is based on and consistent with these nine standards. The KDE has developed an external review process, called a Scholastic Audit, to help schools assess their progress with respect to these standards.

Schools which are not making adequate progress toward their 2014 goal of

“Proficient” face consequences and are provided additional support to facilitate improvement. These lowest performing Kentucky schools are required to undergo a Scholastic Audit, an additional source of anguish. Even though the audit is genuinely designed to uncover needs and discover weaknesses, a forced audit cannot help but carry some stigma of failure. Indeed, to this point, audits have resulted in additional assistance and improvement resources for low performing schools. Yet, positive as this process may be, there is likely some degree of punitive sentiment.

Kentucky schools have a tradition of pride at the local level. The efforts of these schools, coupled with the comprehensive reforms and accountability mandates, have resulted in significant progress in educational standing since KERA was initiated in 1990 (cf. Miller & Moore, 2006). Whether all schools can reach proficiency by 2014 remains to be seen as the reform process unfolds. Particularly for at-risk schools, improvement goals represent a moving target, as these schools are expected to catch up with advantaged schools, even as those higher performing schools are expected to reach even higher goals. Principals, who have been charged with primary responsibility for these higher outcomes, have seen their leadership role evolving in the context of this unprecedented change. The literature cited in this review leaves little doubt that school leaders (principals) are a key ingredient of success, but a host of school environment issues and players mediate much of their influence.

Pressures of accountability may alter leadership behaviors. In fact, accountability models are premised upon the assumption that school personnel will alter their beliefs and practices for the better, thus effecting positive change. Limited research exists, however, that has examined these assumptions under high-stakes conditions. Kentucky seeks to break the bonds of tradition and sweep its leadership into the mainstream of reform. The

goal is yet to be fully achieved, but the framework for success is under construction. One goal of this research is to understand better the principalship as school leaders institutionalize reform coupled with high-stakes accountability. Specifically, it is the premise of this study that school audit data linking Standard 7 (Leadership), Standard 1 (Curriculum), and Standard 3 (Instruction) with CATS accountability scores may reveal characteristics and needs of Kentucky principals, lending insight and direction for supporting the instructional leadership role and improving effectiveness.

The data collected by audit teams on these standards inform the statistical analysis of this research project. Although the audit includes data on each of the nine standards, this study is limited specifically to the central research question: Based on Scholastic Audits, what are the effects of Leadership, Curriculum, and Instruction on Kentucky accountability scores?

CHAPTER III

METHODOLOGY

Introduction

The research conducted in this study is a quantitative analysis of secondary data made available from the Kentucky Department of Education (KDE). Data are analyzed: (a) to examine the effect of school leadership, curriculum, and instruction on CATS scores in Kentucky elementary schools; (b) to investigate any relationships that may exist among certain demographic factors such as gender, school setting, SES, and student achievement. Multiple regression is used to analyze data available through Kentucky Scholastic Audits. Both successful and struggling schools are included in this sample. In multiple regressions, an equation with several explanatory variables is estimated, in an attempt to isolate the separate effect of each on the dependent variable (Smith, 1985, p. 515). The audits provide a score for leadership, instruction, and curriculum to be analyzed for their effect on Academic Index scores.

The study uses data collected by Kentucky Department of Education audit/review teams to determine statistically the impact of school leaders (principals) on instruction, curriculum, and accountability scores. This study examines the relationships among leadership, curriculum, instruction, school accountability scores, and demographic background factors at the elementary school level, with emphasis on the influence of leadership on the other factors. Research indicates that socioeconomic factors in the school and community appear to influence principal leadership and its impact on school

effectiveness (e.g., Andrews & Soder, 1987; Hallinger & Murphy, 1986; Rowan & Denk, 1984, cited in Hallinger & Heck, 1998, p. 178).

Accountability scores are identified as the dependent variable; three of the nine standards from the SISI document have been designated as explanatory variables: Leadership, Instruction, and Curriculum. These factors are identified as significant to Kentucky school success and weigh heavily in Kentucky's high-stakes accountability and evaluation of school effectiveness. Leadership in particular is closely connected to the other two standards. Wagner (1998) states that the principal's activities--making decisions on curriculum (what should be taught) and making decisions on instructional methodology (how it should be taught) are important components for improving schools. Admittedly, there are always other influences (on accountability scores) over which the researcher has no control. Several of these demographic influences have been identified as control variables. With the combination of these factors, the study yields useful data for guiding leadership development and reform.

Definition of Terms

The following list of definitions refers to Kentucky's accountability system.

Kentucky Instructional Results Information System (KIRIS): The Kentucky accountability assessment system from 1991-1998 (KDE, 1998).

Commonwealth Accountability Testing System (CATS): Beginning with the 1998-1999 school year, this more traditional assessment, with higher reliability and less emphasis on performance assessment, replaced KIRIS. The fundamental high-stakes, value-added nature of the accountability system, however, remained unchanged. The CATS goal for every school in the state is Proficiency as defined by the Kentucky Board of Education. The goal of Proficiency translates into a school Accountability Index value

of 100. More specifically, the goal for the state is for each school to achieve an Accountability Index of at least 100 by 2014. The major characteristics of the accountability model are that it involves (a) an index, (b) a measure of growth between successive cohorts (groups of students at the same grade, but in different years), (c) criteria that are applicable to the whole-school, (d) differential weighting of indicators, and (e) recognition points--an indication of absolute standing against Kentucky's performance standards (KDE, 2004b, p. 13).

Academic Index For Elementary Schools (AI): For elementary schools with NRT grades, this Academic Index comprises 90.25% of the overall Accountability Index. Specific content values include: Reading, 19%; Mathematics, 19%; Science, 14.25%; Social Studies, 14.25%; Writing Prompt, 2.85%; Writing Portfolio, 11.4%; Arts and Humanities, 4.75%; Practical Living/Vocational Studies, 4.75% (KDE, 2005). Scores on the KCCT (Kentucky Core Content Tests) determine the school's Academic Index.

Norm Referenced Index (NRT): The NRT component of the state's accountability system is based upon the state-required components of the CTBS/5 Survey Total Battery (reading, language arts, and mathematics). The "index" for the NRT is an average of student scores for each school weighted as follows:

Weight	National Percentile Range
0	1 - 24
60	25 - 49
100	50 - 74
140	75 - 99

The above assignment of weights or scores places the NRT on the same 0 to 140 scale as the KCCT content areas. This comprises 5% of the overall Accountability Index (KDE, 2005).

Nonacademic Index: At the elementary school level, this index represents non-

achievement factors that affect or reflect school quality, weighted as 4.75% of the overall Accountability Index (attendance 3.8% and retention 0.95% (KDE, 2005).

Accountability Index: “The statistic that describes the school or school district’s status for a given year as related to the academic goals as given in KRS 158.6451(1)” (KDE, 1998, p. 32). The Accountability Index consists of three components just noted: Academic Index, the national Norm-Referenced Index (NRT), and the Nonacademic Index.

Baseline Accountability Index: The Accountability Index score that describes the school’s average performance during the 1998-99 and 1999-2000 school years, and is the number against which progress shall be measured (KDE, 2005).

Grades 4 and 5: In Kentucky’s accountability model, test scores of students in grades 4 and 5 comprise the school’s Academic Index (schools selected for the study all include grades 4 and 5). Kentucky Performance Reports compile these scores along with demographics of this student population. For this study, these students define School Size. Therefore in discussing results of the study, School Size and the additional demographic variables--Race/Ethnicity, Free and Reduced Price Lunch Program, Gifted, and Disabled--reference the number of students in grades 4 and 5.

Goal Line: The goal line is represented by a straight line that begins in 2000 at the baseline and ends in 2014 at 100. In any biennium, a school’s growth Accountability Index shall be at or above this line in order to achieve a classification of meets goal in recognition of growth (KDE, 2005).

Assistance Line: The Assistance Line represents the point below which a school becomes eligible for assistance from the state. A straight line that begins in 2002 at the baseline and ends in 2014 at 80 constitutes this line (KDE, 2005, p. 2).

Scholastic Audit: Designed by the Kentucky Board of Education to review a school's learning environment, efficiency, and academic performance of students; evaluate each certified staff member assigned to the school; and report to the Kentucky Board of Education about the appropriateness of a school's classification and the assistance required to improve teaching and learning in the audited school. Scholastic Audit teams are comprised of a parent, teacher, school administrator, district administrator, university faculty member, and a Highly Skilled Educator (Division of School Improvement, 2003, p. 9).

Scholastic Review: The same audit procedure is used but the audit team is reduced to two representatives from the regional service center and two to four representatives from the school's district (Division of School Improvement, 2003, p. 9).

Successful School: A school that achieved an Accountability Index score on the CATS at, or above, its goal for the biennium (Division of School Improvement, 2003, p. 7).

Level 1 Assistance School: A school whose Accountability Index score on the CATS places it in the upper one-third of schools below their assistance line. Most of these schools complete a Self-review using the SISI document as a guide. In 2000-2001, 15 Level 1 schools completed Self-reviews. In 2002-2003, 29 Level 1 schools completed these reviews (Division of School Improvement, 2003, p. 9).

Level 2 Assistance School: A school whose Accountability Index score on the CATS places it in the middle one-third of schools below their assistance line. These schools complete a Scholastic Review. In 2000-2001, 50 Level 2 schools were reviewed. In 2002-2003, there were 32 Level 2 schools reviewed (Division of School Improvement, 2003, p. 9).

Level 3 Assistance School: A school whose Accountability Index score on the CATS places it in the lowest one-third of schools below their assistance line. These schools are required to complete a Scholastic Audit. In 2000-2001, 47 Level 3 schools were audited; 29 Level 3 schools were audited in 2002-2003 (Division of School Improvement, 2003, p. 7).

Leverage Point: An indicator for which results vary greatly from Successful Schools to Level 3 Assistance Schools as determined by the results of the 2000-2001 round of Scholastic Audits (Division of School Improvement, 2003). Across the nine Standards and 88 Indicators, 17 indicators were designated as Leverage Points based on visual inspection of the results (Division of School Improvement, 2003, p. 7).

Variance Point: An indicator where the rating varies greatly when comparing the successful schools' indicator ratings to Level 3 assistance schools' indicator ratings. After the audits were completed in 2002-2003 the term *Leverage Point* was changed to *Variance Point* to describe more accurately the meaning of the term. One difference may have been that a more systematic statistical approach was taken in identifying the points (Douglas Smith, personal communication, September 12, 2006). Twenty-seven indicators were found to be Variance Points as a result of that round of audits. Six Common Variance Points exist when comparing the results of the two rounds of audits (Division of School Improvement, 2003, p. 8). After the third round of audits (2004-2005), KDE found 11 Common Variance Points across the entire set of data, but this was based on revised criteria for what constituted significant variance.

Kentucky Performance Reports (KPR): The reports give detailed information on the results provided by the Kentucky Core Content Tests (KCCT), Writing Portfolio, Norm-Referenced Test, and other components of the Commonwealth Accountability

Testing System (CATS). As required in statute, these reports are received by school districts on or before September 15th each year. The data in these reports are constructed from information provided by many sources: students, schools, district offices, the Kentucky Department of Education, and testing contractors. The KPR is designed to show performance for all content areas and all student subpopulations at the elementary, middle, and high school levels. Therefore, most school and all district Kentucky Performance Reports contain data from at least two different grades (e.g., grades 4 and 5 at the elementary level). The assessment and accountability results are the most important part of the KPR, providing all the summary information pertaining to a school's accountability classification, including the growth chart unique to each school (KDE, 2006e).

Kentucky Core Content Tests (KCCT): These criterion-referenced tests were aligned with the 75 learner objectives which were developed as part of the work of the Council on School Performance Standards (1991), and which define the content that Kentucky students are to know. The KCCT are summative assessments, covering content standards organized by the grade spans provided in the Kentucky Core Content for Assessment. Schools are evaluated by the state every two years on the basis of the size of their Biennial Accountability Indices in comparison to their biennial goals (as well as on satisfaction of their criteria such as reducing the percentage of Novice students). Consequences accrue to schools that fail to meet their biennial targets. The No Child Left Behind Act (NCLB) of 2001 added a federal dimension to Kentucky school accountability. This legislation requires Kentucky to hold schools accountable for Adequate Yearly Progress (AYP) in Reading/Language Arts and Mathematics. In 2003, the Kentucky Department of Education began to monitor schools' progress toward federal goals while it continued to monitor progress toward state goals (KDE, 2004b, p. 154).

Scores on the KCCT tests determine a school's Academic Index.

Highly Skilled Educator (HSE): Change agents charged with turning around low performing schools so that students receive the equitable education they deserve. These HSEs are selected by KDE after an extensive, content-based selection process, which is followed by a lengthy period of training in the audit process as framed by Kentucky's SISI document (KDE, 2006c). The cost of these HSEs is a part of the state's commitment to ensuring that all schools are able to reach their target goals.

Description of the Data

The data for this study were collected by KDE audit teams and analyzed to some degree for Kentucky reports on school improvement (Division of School Improvement, 2003). The data are analyzed to answer the four empirical research questions (see Chapter I, pp. 14-15).

The Kentucky Department of Education conducted scholastic audits or reviews in 131 schools during the 2000-2001 school year. The audits were divided among 83 elementary schools, 28 middle schools, and 20 high schools (Division of School Improvement, 2003, p. 9). Based on Accountability Index scores, they included 47 Level 3 schools (Scholastic Audit required), 50 Level 2 schools (Scholastic Review required), 15 Level 1 schools (Voluntary Scholastic Reviews conducted), and 18 successful schools (Scholastic Reviews were conducted in a sample of successful schools). During the 2002-2003 school year, 114 scholastic audits or reviews were performed. Of these, 29 were classified as Level 3, 32 as Level 2, 29 as Level 1, and 24 as successful (Division of School Improvement, 2003). The audit process is on-going in Kentucky. This study is limited to Kentucky elementary schools that have completed a Scholastic Audit or Scholastic Review from the beginning in 2001 through 2005. The schools have a range of

grade levels but all include grades 4, and 5 (NRT Index comes from grade 3, and 6 if housed in the elementary school; Academic Index comes from grades 4 and 5). Schools with only grades P-3 are not included. This data file results in the study of 181 audited schools over the designated time period ($N = 181$).

The model for KERA assessment is based on cohort studies rather than longitudinal, meaning that school progress or lack of school progress is based on the assessment of different students during each year of the accountability cycle or biennium. In addition to the CATS assessment data, the number of students in each school participating in free or reduced price lunch are included in the data analysis. Since the researcher did not personally administer the instruments or oversee the collection of the data used in this study, the researcher relies on the KDE's audit team findings, their use of consistent audit processes, and their audit training. Audits are performed by a number of trained teams but readers should be aware that inter-rater reliability on the part of audit teams has not been studied (KDE, 2004b, p.178). The research is dependent upon the reliability and validity of Kentucky's audit and testing processes.

The sections that follow detail the Scholastic Audit process, as well as the variables and variable label codes involved in the study. Although overall organization of these variables is described previously, for the sake of clarity, an explanation of each independent variable and the dependent variable is included. Specific operational definitions are included in the respective sections.

Scholastic Audit Methodology

Audit and review teams are trained by the Kentucky Department of Education with the SISI document being the primary assessment and evaluation instrument (Division of School Improvement, 2003, p. 9). Teams also compile results from surveys on leadership

and school culture. The findings from these surveys are considered in the development of reports, along with examination of documents provided in the school portfolio, team experiences, interviews, and observations. The school portfolio includes a variety of materials and documents pertinent to the school, including the school's CSIP, state assessment results, student achievement data, non-academic data, writing portfolio analysis data, school survey data, district technology inventory, school handbook and master schedule, school report card, SBDM council policies and meeting minutes, teacher unit/lesson plans, district evaluation plan, curriculum documents, examples of student work, and listings of school professional development activities (p. 9). The school profile represents an analysis of the portfolio information, naming strengths, limitations, opportunities, and threats faced. Only the explicit scores given to the indicators for the standards are used as data for the purpose of this research. Investigation of supporting documents, school policies, and audit interviews is beyond the scope of this study.

Scholastic audit and review activities include a review of documents collected for the school portfolio and profile, classroom observations, and formal interviews and informal discussions with teachers, students, parents, the principal, assistant principals, counselors and (where appropriate) central office staff (Division of School Improvement, 2003, p. 10). The audit or review teams evaluate the evidence contained above in comparison to the Performance Descriptors for Kentucky's Standards and Indicators for School Improvement for each indicator, under each standard, then agree upon a finding and assign a score for each indicator on the following scale:

Category 1--Little or no development or implementation

Category 2--Limited development and partial implementation

Category 3--Fully functioning and operational level of development and

implementation

Category 4--Exemplary level of development and implementation.

After considerable discussion with persons knowledgeable of Kentucky's accountability and audit procedures (Bill Insko, Lou Spencer, and Robert Wetter, personal communication, August 5, 2005), the decision was made that the original audit scores of 1-4 would be converted to scores of 0, 2, 5, and 7. These values seem to represent more accurately the protracted difficulty of advancing from limited development (2) to fully functioning (3). This seems to parallel the larger gap in Kentucky's scoring rubric associated with moving students from Apprentice to Proficient on the four criterion levels of achievement for the 140 point scale for the KCCT (Novice, 0-39; Apprentice, 40-99; Proficient, 100-139, Distinguished, 140).

Scholastic audit and review teams offer recommendations and next steps to improve performance in each standard. Commendations are also given when the indicators of a particular standard are evaluated as being exemplary. The specific findings of the reports are organized into nine standards under the headings of Academic Performance (Standards 1, 2, & 3), Learning Environment (Standards 4, 5, & 6), and Efficiency (Standards 7, 8, & 9). The resulting school profile represents a consideration of the nine standards with their supporting indicators as an integrated whole. Although KDE emphasizes the cumulative effect of all of the standards with respect to whole-school improvement (Division of School Improvement, 2003, p. 10), analysis of the complete set of standards is beyond the scope of the current study. Yet those data also provide Kentucky with an in-depth picture of school improvement across the state. This extensive collection of data from within the school and classroom walls constitutes a valuable resource yet to be mined by researchers.

Dependent Variable

Obtained from the Kentucky Performance Report (KPR), the dependent variable for the study is the schools' Academic Index (AI) score. The Commonwealth's testing system has stirred a degree of controversy since its inception in 1990. In response to critics and external reviews, some changes have been implemented as reform evolved, e.g., replacing KIRIS with the current CATS. Most recently, Kentucky has aligned accountability testing procedures with federal guidelines (NCLB), but the system continues to serve as the predominant measure of school improvement, now 16 years into the KERA reforms.

Independent Variables

The study includes three conceptually distinct types of independent variables. Specific predictors included under each are described in turn.

Control Variables

The research is designed to control for varying school demographic factors likely to impact school achievement. Common demographic considerations included in the study follow:

School Size (SIZE): Ratio measurement of number of students enrolled in grades 4 and 5, obtained from Kentucky Performance Reports. The reason for students in grades 4 and 5 to be considered for this variable is that they are the only contributors to the dependent variable (Academic Index) for the schools in this sub-sample of audited schools (elementary schools with configurations that did not include grades 4 and 5 or that also included 7 and/or 8 were excluded).

Grades 4 and 5: In Kentucky's accountability model, test scores of students in grades 4 and 5 comprise the school's Academic Index (schools selected for the study all

include grades 4 and 5). Kentucky Performance Reports compile these scores along with demographics of this student population. For this study, these students define School Size.

Race/Ethnicity (%WHITE): Race and ethnicity differences are measured by the percentage of majority students (White) in grades 4 and 5 for each school as quantified for individual schools in the KPR.

Free and Reduced Price Lunch (%FRED): Free and reduced price lunch serves as a proxy for socioeconomic status (SES), is commonly used in education, and is available in the KPR for individual schools (KDE, 2006e). It is measured by the combined percentage of students who participate in Free or Reduced Lunch program in grades 4 and 5.

Appalachian Status (APP): The Appalachian region in Kentucky is an area where the influence of mining typically reinforces the traditional rural mindset (Caudill, 1963). Close to a third of Kentucky's students are in counties defined as Appalachian (Smith, 2005, 2006). The variable is coded by 1 = Appalachian region; 0 = not Appalachian region).

Gifted (%GFT): Gifted is measured by the percentage of students in grades 4 and 5 served in gifted instruction within each school as quantified in the KPR.

Disabled (%DAB): Disabled is the percentage of students in grades 4 and 5 receiving special education services within each school as quantified in the KPR.

County Schools (COUNTY): Schools situated within County systems/districts (as opposed to Independent schools/districts), coded 1 = County, 0 = Independent.

Year of Audit (YRAUD): As schools progress on accountability outcomes, the year in which audits were performed may influence achievement results. Controlling for this adjusts for possibility of statewide improvement over time. Coded for years 2001–2005.

Efficiency

Kentucky's guide for school improvement is framed by nine standards under the headings of Academic Performance (Standards 1, 2, and 3--Curriculum; Classroom Evaluation/Assessment; and Instruction), Learning Environment (Standards 4, 5 and, 6--School Culture; Student, Family and Community Support; and Professional Growth, Development, and Evaluation), and Efficiency (Standards 7, 8, and 9--Leadership; Organizational Structure and Resources; and Comprehensive and Effective Planning). Developed on the basis of extensive research and consultation on the part of the Office of School Improvement, the SISI define the elements of whole-school improvement at the elementary, middle, and high school levels (KDE, 2004b, p. 176). It is believed that these elements lead to effective schools. The SISI document serves as an evaluation tool featuring nine standards and 88 indicators.

The alterable variable under Efficiency in this study is Leadership, Standard 7 of the SISI document. It specifically states that school/district instructional decisions focus on support for teaching and learning, organizational direction, high performance expectations, creating a learning culture, and developing leadership capacity (Division of School Improvement, 2003, p. 21). Eleven indicators evaluate school leadership in terms of Kentucky goals and standards for school leaders, including alignment with ISLLC standards as discussed previously. The specific indicators for leadership are as follows:

7.1. Leadership (LEAD)

- a. Leadership has developed and sustained a shared vision.
- b. Leadership decisions are focused on student academic performance and are data-driven and collaborative.
- c. There is evidence that all administrators have a growth plan focused on the development of effective leadership skills.

- d. There is evidence that the school/district leadership team disaggregates data for use in meeting the needs of a diverse population, communicates the information to school staff and incorporates the data systematically into the school's plan (CSIP).
- e. Leadership ensures all instructional staff has access to curriculum related materials and the training necessary to use curricular and data resources relating to the learning goals for Kentucky public schools.
- f. Leadership ensures that time is protected and allocated to focus on curricular and instructional issues.
- g. Leadership plans and allocates resources, monitors progress, provides organizational infrastructure, and removes barriers in order to sustain continuous school improvement.
- h. The school/district leadership provides the organizational policy and resource infrastructure necessary for the implementation and maintenance of a safe and effective learning environment.
- i. Leadership provides a process for the development and the implementation of council policy based on anticipated needs.
- j. There is evidence that the SBDM (Site Based Decision Making) council has an intentional focus on student academic performance.
- k. There is evidence that the principal demonstrates leadership skills in the areas of academic performance, learning environment, and efficiency. (KDE, 2004b, pp. 32-37)

Academic Performance

The direct classroom influences in this model (see Figure 1) are Standards 1 and 3 --Curriculum and Instruction. These represent, respectively, the content that students are to learn and the teachers' efforts to present that material (current practice). They are immediate and ongoing in their impact on student learning. In the current study, it is presumed that they mediate the more indirect effect of Standard 7, Leadership.

Curriculum (CURR). Standard 1 of the SISI specifically states that the school develops and implements a curriculum that is rigorous, intentional, and aligned to state

and local standards. Leadership indicator 7.1.e. above requires principals to ensure all instructional staff have access to curriculum related materials and the training necessary to use curricular and data resources relating to the learning goals for Kentucky public schools. Seven indicators evaluate curriculum in terms of Kentucky goals and standards for school leaders:

1.1. Curriculum

- a. There is evidence that the curriculum is aligned with the Academic Expectations, Core Content for Assessment, Transformations and the Program of Studies.
- b. The district initiates and facilitates discussions among schools regarding curriculum standards to ensure they are clearly articulated across all levels (P-12).
- c. The district initiates and facilitates discussions between schools in the district in order to eliminate unnecessary overlaps and close gaps.
- d. There is evidence of vertical communication with an intentional focus on key curriculum transition points within grade configurations (e.g., from primary to middle and middle to high).
- e. The school curriculum provides specific links to continuing education, life, and career options.
- f. There is in place a systematic process for monitoring, evaluating and, reviewing the curriculum.
- g. The curriculum provides access to a common academic core for all students. (KDE, 2004b, pp. 5-8)

Instruction (INST). Standard 3 of the SISI specifically states that the school's instructional program actively engages all students by using effective, varied, and research-based practices to improve student academic performance. Leadership indicator 7.1.f. above requires principals to ensure that time is protected and allocated to focus on curricular and instructional issues. Eight indicators evaluate instruction in terms of Kentucky goals and standards for school leaders:

3.1. Instruction

- a. There is evidence that effective and varied instructional strategies are used in all classrooms.
- b. Instructional strategies and learning activities are aligned with the district, school, and state learning goals and assessment expectations for student learning.
- c. Instructional strategies/activities are consistently monitored and aligned with the changing needs of a diverse student population to ensure various learning approaches and learning styles are addressed.
- d. Teachers demonstrate the content knowledge necessary to challenge and motivate students to high levels of learning.
- e. There is evidence that teachers incorporate the use of technology in their classrooms.
- f. Instructional resources (textbooks, supplemental reading, technology) are sufficient to effectively deliver the curriculum.
- g. Teachers examine and discuss student work collaboratively and use this information to inform their practice.
- h. There is evidence that homework is frequent and monitored and tied to instructional practice. (KDE, 2004b, pp. 13-16)

Analysis Plan

In the sections that follow, the author describes the various aspects of the data analysis used in the study: data checking/coding, descriptive statistics, psychometric analysis, and multiple regression.

Data Checking and Coding

Secondary data analysis or analysis based on data collected by others is used in this study. Reliability and accuracy of this data is admittedly dependent upon the care with which the data are compiled. The data used were compiled by the Kentucky Department of Education and are a result of highly-trained auditors and very refined audit documents. Kentucky's audit procedure offers the researcher the benefit of a thorough, on-site survey

of conditions at the school level, framed by the state's accountability model. Nachmias and Nachmias (1987) note several advantages for using secondary data: (a) opportunity for replication studies; (b) increase in the sample size, thus enhancing confidence in the data and increasing generalizability of the results; (c) provision of data which is the only opportunity to study the past; (d) possibility for research using trend data, which is usually prohibitive in longitudinal studies because of the time, personnel and cost involved; and (e) cost savings in the use of existing data.

There are also a number of limitations involved in using secondary data. The data may only approximate the kind of data the investigator would like to have for testing hypotheses. There is likely to be a gap between data collected by the investigator with specific research purposes and intentions and data collected by others. The researcher may not have sufficient information about the collection of the data to determine potential sources of bias, errors, or problems with internal and external validity (Nachmias & Nachmias, 1987, p. 315). Issues related to reliability and validity are addressed later in this chapter.

Limitations normally posed by the use of secondary data are minimized in this study. The data base is limited to schools participating in the audit process. While this offers valuable insight when low-performing schools are compared with successful schools, the audit data are not equally divided between low-performing schools and voluntary school settings, and the circumstances surrounding the audit are somewhat different. Questions about authenticity and accuracy related to the Scholastic Audit data used in this research are minimized by the use of trained audit teams and consistent audit procedures. Furthermore, the use of data gathered by an intense, thorough, in-school, and in-the-classroom audit is an opportunity rarely afforded educational researchers.

Descriptive Statistics

Descriptive statistics are reported for all demographic data, school audit responses, and school achievement scores. This includes all variables, both dependent and independent. The latter are organized according to the three types of predictors described in the theoretical model (Figure 1). In this section, the demographic factors and dependent variable are reported. Descriptives for the Leadership, Curriculum, and Instruction standards are included in the section below.

Psychometric Analysis

Psychometric analysis involves the application of both factor analysis and Cronbach's (1951) alpha. Factor analysis is conducted on the set of indicators for each of the three standards (Leadership, Curriculum, and Instruction). Results of this analysis guide the researcher as to whether items (audited indicators detailing each standard) are treated individually or as groups (cf. Nunnally & Bernstein, 1994). Although not specifically designed as survey research questions, the standard indicators serve such purpose in this study. Because this usage represents a new construct, psychometric procedures are utilized to check assumptions as to the efficaciousness of the indicators developed for each standard by the KDE. To the author's knowledge, no empirical work exists to verify the extent that the respective indicators in each standard represent some unitary latent construct.

Cronbach's alpha indicates the internal consistency of the set of factors derived from the factor analysis of the standards for leadership, curriculum, and instruction. A high alpha value indicates that the variables are measuring the same construct; that is to say, there is good internal reliability of the scale. A low alpha value implies that the variables are measuring multidimensional constructs, suggesting that the items are better viewed as

separate variables. Nunnally and Bernstein (1994) suggest that a coefficient alpha of at least .6 may be acceptable, especially for exploratory work, although values of .7 are preferred for scales.

Regression Model

Multiple regression analysis allows the comparison of independent variables to see the extent to which each one helps to explain or predict the dependent variable. In this research, multiple regression is used to assess the extent to which the variability of CATS scores (the dependent variable) could be explained by the different independent variables-- leadership, curriculum, instruction, and demographic factors. According to Huck (2000) this kind of analysis is appropriate when there are two or more independent variables but only one dependent variable being analyzed. A combination of variables usually results in a more accurate prediction than any one variable (Gay, 1996, p. 482). The method can also determine not only whether but also the degree to which variables are related, as well as an estimate of the overall effect size.

This research tests theoretical assumptions about school leadership, instruction, and curriculum while examining their influence on accountability scores. The relative importance of each predictor may be judged based on the degree to which predictor variables account for variance in CATS scores. The focus is not on determining the "optimal" set of predictors but to investigate the extent that Kentucky goals for leadership, curriculum, and instruction influence school improvement. Multiple regressions allow the researcher to accommodate variables that are to be controlled. Though it is impossible to consider every possible control factor, the variables selected for this study are well known for their influence in studies of education. Kentucky goals and guidelines create a strong link among leadership, curriculum, and instruction and school success. These quantitative

results may then guide and focus the support needed for continued improvement.

The mechanics for computing multiple regression estimates are quite complicated. Statistical software is utilized (SPSS) to compute results. The researcher anticipated (and prior Kentucky accountability procedures predict) that the explanatory variables have substantial, statistically significant effects on a school's Academic Index. Although the complexity of exogenous variables and intra-organizational processes in schooling represents a challenge for researchers who seek to study causal relationships (Bossert et al., 1982; Boyan, 1988; Pitner, 1988, all cited in Hallinger & Heck, 1998), the study attempts to quantify the degree to which principals contribute to school success in Kentucky.

A brief discussion of inferential statistics is useful here. Multiple regression is an inferential procedure, wherein relationships that exist in sample statistics are the basis of inference back to the full population. Caution is in order due to the selection/availability of research data from only audited schools. Kentucky's Scholastic Audits are not administered to a random sample of schools. Rather, the schools audited in the current study represent different contexts with respect to performance and participation in the audit process. Both low-performing schools (Scholastic Audit/Reviews mandated) and more successful schools (Audits/Reviews voluntary) are represented in the sample. Although the audit procedures are similar for both groups, the reason for the audit is different. In the case of low-performing schools, attitudes may be more defensive or threatening. In successful schools the audit is more likely to be viewed as utilitarian, useful for gaining positive recognition, or data for continuing improvement. Such attitudes may influence auditor perceptions to a degree and limit generalizability.

Simultaneous Multiple Regressions

Typically, multiple regression is used as a data-analytic strategy to explain or

predict a criterion (dependent) variable with a set of predictor (independent) variables (Petrocelli, 2003, p. 9). Simultaneous regression is typically used to explore and maximize prediction, whereas hierarchical regression is typically used to examine specific theoretically based hypotheses (Petrocelli). In simultaneous multiple regressions all of the data associated with the independent variables, in this case leadership, curriculum, instruction, and demographic factors, are entered into the analysis at one time, depending on the logic of a given research question (Huck, 2000). This analysis isolates the unique contribution of each separate independent variable entered into the equation, in that both raw and standardized regression coefficients as well as the t score and its statistical significance are reported for each independent variable. The resulting R^2 value represents the percentage of variability of the CATS scores attributed to those particular independent variables.

Hierarchical Multiple Regression

Hierarchical regression involves apriori based decisions for how predictors are entered into the analysis (Petrocelli, 2003, p. 9). Huck (2000, p. 433) notes that in this type of regression, the independent variables are entered into the analysis in stages. Often, the independent variables entered first are those corresponding with things the researcher wishes to control. After explaining their portion of the variability in the dependent variable, then the other variables are entered to see if they can contribute above and beyond the independent variables that went in first (Huck, p. 433). Hierarchical regression generates several R^2 values, one for each stage of the analysis as independent variables are added. Adjusted R^2 values generate a form of proportion or percentage, indicating the degree to which variability in the dependent variable is explained by the set of independent variables included in the analysis.

It is also sometimes useful to examine common effects (in general, the difference between the sum of all of the unique effects of all predictors and the total explained variance). Commonality analysis is useful if the researcher wants to find the unique variance of the criterion explained by an independent variable as well as the degree to which the predictability of that indicator is common to and overlapping with other predictor variables (Petrocelli, 2003). A variable's unique effect could be relatively small while its associated common effects are relatively large, thus rendering it an important variable after all.

Empirical Research Questions

The four empirical questions which guide the research are listed here for the reader's convenience:

To what degree do(es):

1. Leadership (Standard 7) affect Curriculum (Standard 1), Instruction (Standard 3), and the Academic Index?
2. Curriculum (Standard 1) and Instruction (Standard 3) affect the Academic Index?
3. Demographic factors affect Leadership (Standard 7), Curriculum (Standard 1), Instruction (Standard 3), and the Academic Index?
4. Curriculum (Standard 1) and Instruction (Standard 3) mediate the effect of Leadership (Standard 7) on the Academic Index, controlling for demographics?

Table 1 lists the multiple regressions to be calculated, by research question. Prior to these analyses, the Pearson r correlation matrix, upon which all subsequent regressions are based, is included here.

For the model investigated in this study (see Figure 1), there are two standards under the general heading, Academic Performance. Although Curriculum and Instruction are clearly related, they are typically treated separately in schools. Efforts by educators to

Table 1

Variables and Type of Multiple Regression by Research Question

Empirical Research Questions	Independent Variables			Dependent Variable(s)	Type of regression
	Control Variables	Efficiency	Academic Performance		
1		LEAD		AI	Simultaneous
1		LEAD		CURR; INST	Simultaneous
2			CURR; INST	AI	Simultaneous
3	DEMV			LEAD	Simultaneous
3	DEMV			CURR; INST	Simultaneous
3	DEMV			AI	Simultaneous
4	DEMV	LEAD	CURR; INST	AI	Hierarchical

align the content defined by the curriculum and that actually covered through instruction reflect both the importance of their congruence for accountability and the reality that they are distinct entities with respect to how teachers approach them, and therefore need to be aligned (KDE, 2003). For the purpose of this study, the two standards are examined separately. For both RQ1 and RQ3, this means that there are two univariate regressions rather than a single multivariate analysis (see Table 1).

In addition to the four research questions, there are two supplemental inquiries designed to examine empirical support for the Kentucky Department of Education's Leverage Points, Variance Points, and Common Variance Points. Since this study is limited to elementary school data, results for the supplementary questions pertain only to that population. Comparison to the state's Leverage Points, Variance Points, and Common Variances points are limited by the fact that these points are compiled from data inclusive of elementary, middle, and high schools.

Supplemental Research Questions:

1. To what extent are results of factor analysis of the sets of indicators for Standards 1, 3, and 7 consistent with the Leverage Points, Variance Points, and Common Variance Points identified by KDE?
2. To what extent are results of multiple regressions based on Figure 1 for this study consistent with results of regression analyses based on the 11 Common Variance Points established by KDE across all audit periods?

Supplemental Research Question 1 is addressed by comparing the results of the factor analysis for the three standards to the Leverage Points, Variance Points, and Common Variance Points established by KDE across the different audit periods, 2001-2002, 2002-2003, 2004-2005 (KDE, 2006f). With respect to Nitko's (2001) eight types of validity, the factor analysis represents internal structure evidence (one aspect of traditional construct validity). In contrast, KDE's identification of indicators that represent divergence

across high and low scoring schools constitutes both internal structure evidence and external structure evidence (both aspects of traditional construct validity).

For SRQ2, the results from the analysis of RQ1-4 is compared to additional regression analyses conducted on the 11 Common Variance Points established by KDE across all audit periods. In each case, the Academic Index (AI) is regressed on the full set of indicators for that standard, with predictors identified as significant compared to the KDE Common Variance Points. The KDE Common Variance Points can then be compared to the results across the entire data set. These analyses represent Nitko's (2001) external structure evidence.

Finally, additional analyses were required with respect to the psychometric computations, as described above. The variables identified through factor analysis and Cronbach's alpha constitute internal structure evidence under current thinking about measurement (Nitko, 2001), i.e., the factors were computed with respect to variance explained among the set of items themselves, with no connection to any possible related variables. But not all items in the identified factors are necessarily equally associated with constructs externally situated. In other words, selected items may "drive" the factor with respect to a related measure.

This was checked by a simultaneous regression in which the AI is the dependent variable (Nitko's external structure evidence) and the separate indicators from each factor previously identified are the predictor variables. This procedure was conducted for each factor identified under Leadership, Curriculum, and Instruction. Results of this analysis were then compared to KDE's Leverage Points, Variance Points, and the 11 Common Variance Points.

For example, it could be the case that an identified factor had seven indicators, all

measuring the same construct internally, but that only two of these predict achievement outcomes (consistent with KDE identified key indicators that distinguish high and low schools). That would suggest that a more parsimonious factor composed only of those indicators which are common to both the internal evidence (from the factor analysis) and the external evidence (significant for accountability measures) is possible. Collectively, these supplemental calculations provide further evidence on the specific indicators that drive school improvement, and the nexus between the typical approach to multiple regression (including typical psychometric computations) and the outlier analysis of key indicators conducted by KDE.

Reliability and Validity

Reliability in everyday use implies dependability or trustworthiness. With respect to research measurement, reliability is the degree to which a test consistently measures whatever it measures (Gay, 1996, pp.144-145). Validity is the degree to which a test measures what it is supposed to measure and, consequently, permits appropriate interpretation of scores. This study design largely leaves concerns for reliability and validity in the hands of testing/measuring processes embedded in Kentucky's accountability model and Kentucky's well-established design for school improvement.

The value of scientific research is partially dependent on the ability of individual researchers to demonstrate the credibility of their findings (LeCompte & Goetz, 1982, p. 31). Accountability scores (this study's dependent variability) have been reviewed and refined from the inception of reform in 1990 (KERA). Reliability and validity on this level have been accepted and are beyond the scope of this study. Similarly, the research data are a product of Kentucky's Scholastic Audit, an adopted state instrument for school improvement (SISI). Survey procedures are carefully defined and controlled by

specialized training for audit team members.

External validity addresses the degree to which generalization may be made across the larger study population. The population for this study was primarily selected by Kentucky performance standards through school accountability scores (identifying acceptable school progress toward Kentucky goals) and all audited elementary schools were included in the data set. The fact that all audited schools were scored by trained personnel, using the SISI document, enhances the degree of external reliability and generalization is enhanced somewhat by the inclusion of audit data from successful schools. However, as indicated above (*Regression Model*), the fact that the audited schools are either required (lowest achieving) or voluntary (higher achieving) limits generalizability.

Validity is generally considered the more important of the two (compared to reliability). For any instrument, validity (the extent to which it measures what it purports to measure) is a critical concern. The survey instrument for this study is a state document developed for school improvement. The document is the singlemost guide for evaluating individual school progress in Kentucky. Audit and review teams, trained by the Kentucky Department of Education, use this document (Kentucky's Standards and Indicators for School Improvement, SISI) as the primary assessment and evaluation instrument in compiling detailed school improvement reports. The instrument is aligned with Kentucky standards and specified by indicators which actually serve as the survey questions for this research.

Finally, whatever the merits of Kentucky's school improvement model (SISI) in terms of reliability and validity, it is the official policy of the Commonwealth; the SISI constitute the set of common standards upon which schools are evaluated and any

recommendations for assistance are to be based (Division for School Improvement, 2003, p. 9). Likewise, the measure of school achievement (CATS Academic Index--this study's dependent variable) is closely aligned with state standards and serves as the major portion of the official benchmark of school progress in Kentucky, the Accountability Index. The Kentucky Department of Education is required by statute to ensure that the instruments it uses to measure student achievement for school accountability provide reliable results (KDE, 2004b, p. 141). Since this study is based on secondary analysis, the statewide testing results constitute a logical measure of school performance.

Ethical Issues

It is a basic premise of ethical research that respondents should be informed of the study's purpose, value, and confidentiality. This study was presented for review in accordance with University of Louisville and Western Kentucky University human studies policy. (See Appendix G for letters of approval.) The review is intended to insure that no harm to the human participants occurs as a result of research participation. Approval documentation is included in the appendix section. Since the study is based on secondary data collected by Kentucky audit teams (with no schools singled out or identified in the research), any risk to audited schools or individuals is minimized. Further, because the research design is unobtrusive and nonreactive (Webb, Campbell, Schwartz, & Sechrest, 1996), it can be conducted without disturbing the school setting in any way.

Summary

This research constitutes secondary analysis based on data collected by the Kentucky State Department of Education through Scholastic Audit teams. The study examines the relationships between leadership, curriculum, instruction, and student achievement at the elementary school level with statistical consideration of certain

demographical variables. Student achievement is measured by the Commonwealth Accountability Testing System (CATS) in Kentucky. The overall Accountability Index testing system combines the Kentucky Core Content Tests (KCCT) which are criterion-referenced, aligned with Kentucky standards, and the CTBS/5 Survey Edition, a national norm-referenced test, along with some non-cognitive factors. The bulk of the Accountability Index (90.25%) comes from the Academic Index based on the subject matter in the KCCT.

Research data were gleaned from Scholastic Audit reports conducted by the Kentucky Department of Education and based on Kentucky's Standards and Indicators for School Improvement (SISI). The SISI document consists of nine standards subdivided into three groupings (Appendix A). Three standards comprise Academic Performance (Curriculum; Classroom Evaluation/Assessment; and Instruction), Learning Environment (School Culture; Student, Family and Community Support; and Professional Growth, Development and Evaluation), and Efficiency (Leadership; Organizational Structure and Resources; and Comprehensive and Effective Planning) (KDE, 2004a). Only three of the nine standards are considered in this research--Leadership, Curriculum, and Instruction.

All Kentucky schools are tested annually with a reported Academic Index score (the dependent variable for this study). This research attempts to isolate the separate effect of each independent variable on the dependent variable in order to untangle these influences, determining the extent that the Academic Index (school achievement) depends on leadership, as mediated by instruction and curriculum. Multiple regression procedures account for demographics and determine the effect of leadership on instruction and curriculum as well as on accountability. The direct effects of instruction and curriculum on the Academic Index are also investigated. In addition, there is also an analysis of the

demographic variables on the CATS scores. The research utilizes simultaneous and hierarchical multiple regressions as the primary methods of computation in this study. Descriptive statistics are reported, along with psychometric analyses of the audit data for Standards 1, 3, and 7.

Since the research database is a product of Kentucky's Scholastic Audit process, reliability and validity of the data are outside the purview of the researcher. The effectual survey questions of the research are, in fact, framed by the state's audit guide (Standards and Indicators for School Improvement, SISI). The SISI document, clearly a product of Kentucky's accountability framework, is the statewide standard by which school progress is monitored and serves as a guide for improving decision making. The powerful influence of this document with respect to a school's accountability standing lends considerable validity to its use as a research survey instrument. The added benefit of being administered by highly trained audit teams, independent of the school setting while at the same time performed in the school setting, strengthens the researcher's position that validity and reliability issues are minimal. This secondary database (with particular schools not identified) provides for confidentiality. The research design is unobtrusive and nonreactive in nature, thus protecting school personnel in the sampled schools from ethical harm.

CHAPTER IV

RESULTS

Introduction

The purpose of this study was to contribute to understanding of the organizational role of Kentucky elementary principals (measured by Kentucky Scholastic Audits) as they function within a high-stakes accountability environment and affect student learning (measured by CATS performance assessment). More specifically, the principal's role is investigated by comparing scholastic audit findings related to Leadership, Curriculum, and Instruction with accountability scores (Academic Index). These variables do not encompass the whole of Kentucky's reform effort but they are key factors in probing for the means by which Kentucky principals carry out their legislated function as instructional leaders and strive to lead schools to the achievement of accountability goals. Adding context to the study, various demographic factors are included to further clarify findings.

The investigation used secondary analysis of data collected by Kentucky Department of Education audit/review teams to determine statistically the impact of school leaders (principals) on Instruction, Curriculum, and Academic Index scores. Five rounds of audits from 2001 to 2005 provide data for the study of 181 Kentucky elementary schools. The study examined relationships among Leadership and Academic Index scores, as well as effects mediated by Curriculum and Instruction, and controlling for demographic background factors at the elementary school level. The emphasis is the central influence of Leadership in the model.

Multiple regression analysis was used to determine the relationships outlined in the core research questions. These relationships can be seen more clearly as laid out in Table 1, which distinguishes the different types of variables and their hypothesized linkages. A more graphic visual diagram of the study may be viewed on page 16 (Figure 1).

Descriptive Statistics

Data for the study were obtained from the Kentucky Department of Education (KDE) compiled as a result of Scholastic Audits. Data were collected by specifically trained teams, using consistent methods and an instrument designed by KDE for the purpose of school improvement. This carefully designed system minimizes or eliminates many of the problems related to data collection. For example, in this case, the researcher found no missing data or unexpected values. The Scholastic Audit is electronically compiled by KDE and available for public viewing or purposes of research.

Demographic and performance data (Academic Index, the study's dependent variable) were obtained from Kentucky Performance Reports. These reports are available electronically from the KDE, providing school improvement feedback to all Kentucky schools, as well as for research purposes. Again, the data are carefully compiled by state guidelines providing complete and reliable data sets: no missing or out of range values were found. KPR data were hand-entered into the scholastic audit data file obtained from KDE.

Descriptive statistics are reported for the demographic data, Leadership, Curriculum, Instruction, and school achievement scores (Academic Index). Summaries are reported for each variable. The study included 181 audited elementary schools in Kentucky. Kentucky Core Content Test (KCCT) scores from grades 4 and 5 are weighted and combined to produce the school's Academic Index and the demographic variables

reported reflect these two grades. The background variables included are School Size, Percent White, Appalachian, Percent Free and Reduced, County School (as compared to Independent schools), Percent Gifted, Percent Disabled, and Year of Audit. School Size, Percent White, Percent Free and Reduced, Percent Gifted, and Percent Disabled are all based on grades 4 & 5 only.

These elementary schools were audited in five rounds from 2001 to 2005. 2001 provided 56 cases; 2002, 17 cases; 2003, 80 cases; 2004, 5 cases; and 2005, 23 cases ($N = 181$). The larger sample years are due to most audits occurring after the two-year accountability cycle peculiar to Kentucky's accountability design. The sample included all audited schools containing grade 4 and grade 5; schools also containing grades 7 and 8 at the elementary level were not included. Student populations were confined to grades 4 and 5 since only these student scores generate the Academic Index for elementary schools. Currently, Kentucky has a total of 760 elementary schools (KDE, 2007).

Independent Variables

The Independent Variables for this study are divided into three conceptual groupings, following the distinctions by KDE (2004d) in the *Standards and Indicators for School Improvement (SISI)*: Demographic Controls, Efficiency, and Academic Performance. Only the descriptive statistics for the Demographic Controls are presented here. The data for Leadership (Standard 7), Curriculum (Standard 1), and Instruction (Standard 3) are presented in the section below, Psychometric Analysis.

Demographic Controls

Demographic Controls for the study include School Size (SIZE), Percent White (%WHITE), Appalachian (APP), Free and Reduced Lunch (%FRED), County or Independent School district (COUNTY), Percent Gifted (%GFT), Percent Disabled

(%DAB), and Year of Audit (YRAUD). Table 2 reports the descriptive statistics for these indicators. Notable is the relatively small school size, because only grades 4 and 5 are included; the relatively large standard deviation reflects the considerable variation in the size of these schools. The mean of 61% for Free and Reduced Lunch is higher than the statewide average (around 50%) (Miller, Smith, & Ennis, 2006). This is likely because the Level 1 schools that are required to have an audit due to inadequate progress with respect to their Accountability Index goals are predominantly low income. The values for Appalachian and County indicate that slightly less than half of the schools are in Appalachian Counties and almost all are in County schools districts, respectively.

Table 2

Descriptive Statistics for Demographic Controls (N = 181)

Measure	<i>M</i>	<i>SD</i>	Minimum	Maximum	Range
SIZE	119.04	57.34	23.00	297	274
%WHITE	84	20	17	100	83
%FRED	61	21	5	98	93
%GFT	14	10	0.0	42	42
%DAB	15	7.49	3	51	48
APP	.40	.49	0.0	1	1
COUNTY	.91	.29	0.0	1	1
YRAUD	2001.57	1.3	2000	2004	4

Dependent Variable

Descriptive statistics for the dependent variable (Academic Index) are presented here to help the reader understand study results. Keep in mind that the Academic Index is an accountability score and provides a picture of where a school stands in reference to its goal line. The demographic data for the study are based on the student population generating the Academic Index. Kentucky goals are based on a progress continuum from an established baseline to Proficiency. The target score for Proficiency is 100; the highest possible score is 140 for those schools scoring above Proficiency. The lowest performing school in the study had an overall Academic Index of 36. The highest performing school in the study achieved an index of 104. The range of 68 is high due to the fact that both low-performing and successful schools are included in the study. The Academic Index mean and standard deviations for the 181 schools comprising the study are 62 and 12.2, respectively. This mean value appears to be low for the state because most of the schools in the study are low performing (struggling) schools.

Psychometric Analysis

Each of the nine standards in the SISI document (KDE, 2004d) has a set of indicators that represent behaviors or attitudes associated with the respective standards. Although these indicators were selected on the basis of both theoretical considerations and empirical evidence, the KDE has done no formal psychometric assessment of the sets of indicators to determine if they constitute a unitary factor or contain subfactors. Accordingly, factor analysis was conducted on the three sets of indicators that are part of this study. Subsequently, Cronbach's (1951) alpha was conducted to examine the internal reliability of the factors resulting from these computations for each of the three standards investigated. Results of these analyses are organized consistent with the groupings in

Figure 1--Efficiency and Academic Performance.

Efficiency

In this study, the only standard included from the Efficiency grouping is Leadership (Standard 7), with 11 indicators. A factor analysis of these 11 items indicated that a single factor emerged for all indicators. With Leadership as a single factor, 54.6% of the variance among the indicators is explained. Following the factor analysis, Cronbach's coefficient alpha was computed on the single factor to determine internal reliability of the scale. Table 3 presents these analyses on the 11 Leadership indicators. With an overall composite alpha of .915, these results reflect an exceptional degree of internal reliability and confirm the factor analysis. The 11 indicators for Leadership constitute a single coherent factor with strong, consistent measurement of the school leadership construct. The mean and standard deviation for both the individual items and the composite scale likewise indicate good psychometric properties (for the composite scale, $M = 2.90$, $SD = 1.37$).

Table 3

Internal Reliability and Item Characteristics for Standard 7, Leadership (N = 181)

Indicator	<i>M</i>	<i>SD</i>	Range	$\alpha - d^a$
7.1.a	2.41	1.86	7	.911
7.1.b	2.97	1.68	7	.905
7.1.c	3.24	2.05	7	.912
7.1.d	3.04	1.84	7	.907
7.1.e	3.17	1.87	7	.905
7.1.f	2.95	1.93	7	.908
7.1.g	3.14	1.92	7	.899
7.1.h	3.77	1.82	7	.912
7.1.i	1.94	1.74	7	.910
7.1.j	2.09	1.77	7	.907
7.1.k	3.19	2.03	7	.901
Total	2.90	1.37	6.64	.915 ^b

^a $\alpha - d$ = alpha with item deleted.

^bValue for $\alpha - d$ for Total is Cronbach's coefficient alpha for the entire scale.

Academic Performance

From the Academic Performance grouping of the nine standards in the SISI document, Curriculum (Standard 1) and Instruction (Standard 3) are included in this study. The seven indicators for Curriculum explained 56.9% of the variance among this

set of items, with a single factor found. Subsequently, Cronbach's alpha was calculated, to assess scale reliability. Analyses on the seven Curriculum indicators are presented in Table 4, reflecting an exceptional degree of internal reliability (composite alpha of .872). The 7 indicators represent a single coherent factor for the Curriculum construct. Both individual items and the composite scale indicate good psychometric properties; the composite scale has mean and standard deviation of 2.25 and 1.26, respectively.

Table 4

Internal Reliability and Item Characteristics for Standard 1, Curriculum (N = 181)

Indicator	<i>M</i>	<i>SD</i>	Range	$\alpha - d^a$
1.1.a	2.73	1.77	7	.858
1.1.b	2.36	1.57	7	.857
1.1.c	2.35	1.70	7	.848
1.1.d	1.82	1.54	7	.856
1.1.e	2.45	1.82	7	.862
1.1.f	1.86	1.62	7	.853
1.1.g	2.13	1.70	7	.847
Total	2.25	1.26	6.71	.872 ^b

^a $\alpha - d$ = alpha with item deleted .

^bValue for $\alpha - d$ for Total is Cronbach's coefficient alpha for the entire scale.

Kentucky's Standard 3 (Instruction) is comprised of eight indicators. Factor analysis produced a single factor explaining 51.0% of the variance internal to the standard.

Reliability of the scale was high (Cronbach's coefficient $\alpha = .857$ for the overall composite α), confirming a single instructional construct. Table 5 presents analyses for the eight Instruction indicators. Again, the mean and standard deviations for both the individual items and the composite scale have acceptable range ($M = 2.13$, $SD = 1.08$).

Table 5

Internal Reliability and Item Characteristics for Standard 3, Instruction (N = 181)

Indicator	<i>M</i>	<i>SD</i>	Range	$\alpha - d^a$
3.1.a	1.70	1.37	7	.833
3.1.a	2.06	1.61	7	.833
3.1.c	1.62	1.33	5	.827
3.1.d	3.09	1.74	7	.839
3.1.e	1.85	1.40	5	.852
3.1.f	3.13	1.74	7	.844
3.1.g	1.59	1.36	7	.846
3.1.h	2.01	1.57	5	.845
Total	2.13	1.08	5.25	.857 ^b

^a $\alpha - d$ = alpha with item deleted.

^bValue for $\alpha - d$ for Total is Cronbach's coefficient alpha for the entire scale.

Research Questions

Four empirical questions guided this research. They are listed in turn as the results are presented. Subsequently, two supplemental research questions are addressed. The

psychometric analyses of indicator sets for the three standards revealed that each is represented by a single factor; factor scores from these factor analyses for the three standards were utilized to represent Standards 1, 3, and 7 in the regressions that follow. Table 1, in Chapter III, describes the specific variables and type of multiple regression calculated for each research question. (Research Questions 1-3 use simultaneous regression; Research Question 4 employs hierarchical regression to enter the variables in the order hypothesized by Figure 1 and specified in Table 1).

Table 6 reports the correlation matrix for all the variables of this study, the basis of the regressions that follow. Correlations among the variables generally are not very strong, with the highest values only of moderate strength (approximate range of .40 to .60). Percent Gifted and Percent Free and Reduced demonstrate a moderate impact on the Academic Index. The highest correlations noted are clustered around the standards of the study--Curriculum, Instruction, and Leadership--as they relate to the dependent variable (Academic Index). The highest single correlation is $r = .693$ for Curriculum with Instruction. With Leadership being the focal interest of this study, it is interesting to note that it correlates well with Curriculum, Instruction, and the Academic Index. Instruction provided the highest correlation value with the Academic Index ($r = .593$), a common finding in educational literature.

Table 6

Correlations for Demographic Factors, Leadership, Curriculum, Instruction, and Academic Index (N = 181)

	AI	CURR	INST	LEAD	SIZE	%WHITE	%GFT	%FRED	%DAB	APP	COUNTY	YRAUD
AI	--	.495**	.593**	.509**	.150*	.305**	.526**	-.581**	-.266**	-.085	.212**	.475**
CURR		--	.693**	.595**	.103	.028	.200**	-.271**	-.145	-.114	.010	.228**
INST			--	.600**	.101	.061	.269**	-.367**	-.180*	-.190*	.115	.211**
LEAD				--	.184*	.080	.232**	-.347**	-.172*	-.067	.105	.116
SIZE					--	-.177*	.058	-.433**	-.128	-.303**	.078	.061
%WHITE						--	.255**	-.223**	-.109	.540**	.224**	-.113
%GFT							--	-.420**	-.243**	.055	-.065	.253**
%FRED								--	.349**	.389**	-.105	-.100
%DAB									--	.008	-.115	-.016
APP										--	.149*	-.152*

(table continues)

Table 6. (*continued*)

	AI	CURR	INST	LEAD	SIZE	%WHITE	%GFT	%FRED	%DAB	APP	COUNTY	YRAUD
COUNTY											--	.083
YRAUD												--

* $p < .05$. ** $p < .01$.

Research Question 1

To what degree does Leadership (Standard 7) affect Curriculum (Standard 1), Instruction (Standard 3), and the Academic Index?

Tables 7, 8, and 9 display results used to answer Research Question 1. Table 7 details the results of simultaneous multiple regression analysis to determine the effects of Leadership on Curriculum. Leadership yields a significant effect on Curriculum, $F(1, 179) = 98.33, p < .001$. The Adjusted R^2 of .35 indicates the model explains 35% of the variation in Curriculum, a modest effect. Leadership is statistically significant at the $p < .05$ level. The B column (raw/unstandardized coefficient) indicates that a one unit increase in Leadership would produce a .6 unit increase in the dependent variable (Curriculum).

Table 7

Regression of Standard 1, Curriculum, on Standard 7, Leadership (N = 181)

Variable	B	$SE\ B$	Beta	t	Sig. t
Constant	5.954E-17	.06		.000	1.000
Leadership	.60	.06	.60	9.916	< .001

Results of simultaneous regression to determine the effects of Leadership on Instruction are presented in Table 8. Leadership is significant, $F(1, 179) = 100.81, p < .001$. The Adjusted R^2 is .36, again a modest effect. The raw coefficient B indicates that a one unit increase in Leadership would produce a .6 unit increase in the dependent variable (Instruction), the same effect as for Curriculum in Table 7.

Table 8

Regression of Standard 3, Instruction, on Standard 7, Leadership (N = 181)

Variable	<i>B</i>	<i>SE B</i>	Beta	<i>t</i>	Sig. <i>t</i>
Constant	1.249E-16	.06		.000	1.000
Leadership	.60	.06	.60	10.041	< .001

Multiple regression to determine the effects of Leadership on the Academic Index resulted in the data displayed by Table 9. Leadership is significant, $F(1, 179) = 62.74$, $p < .001$. The effect size of .26 is slightly less than the influence of Leadership on Curriculum and Instruction in Tables 7 and 8, but still accounts for a quarter of the variation in the Academic Index. The unstandardized *B* coefficient shows that a one unit increase in Leadership would produce 6.2 units increase in the dependent variable (Academic Index). Looking at Beta, a one unit increase in the standard deviation for Leadership would produce a change of .51 standard deviation units in the Academic Index.

Table 9

Regression of the Academic Index, on Standard 7, Leadership (N = 181)

Variable	<i>B</i>	<i>SE B</i>	Beta	<i>t</i>	Sig. <i>t</i>
Constant	62.12	.78		79.40	< .001
Leadership	6.21	.78	.51	7.92	< .001

Research Question 2

To what degree do Curriculum (Standard 1) and Instruction (Standard 3) affect the

Academic Index?

Table 10 displays the influence of Curriculum and Instruction on the Academic Index. The ANOVA is significant, $F(2, 178) = 51.31, p < .001$, with an effect size of 36%, slightly more than one third of the variation in the Academic Index. Within the model, Instruction is statistically significant at $p < .001$, while Curriculum is nearly significant at $p = .053$. The B column indicates that a one unit increase in instruction produces a gain of 5.9 units in the dependent variable (Academic Index). The standardized Beta of .48 units for Instruction indicates an increase of one standard deviation for instruction would produce a gain of almost half a standard deviation on the Academic Index. So instruction is more important than curriculum.

Table 10

Regression of the Academic Index on Standard 1, Curriculum and Standard 3, Instruction
($N = 181$)

Variable	B	$SE\ B$	Beta	t	Sig. t
Constant	62.12	.73		85.503	< .001
Curriculum	1.96	1.01	.16	1.944	.053
Instruction	5.88	1.01	.48	5.823	< .001

Research Question 3

To what degree do Demographic factors affect Leadership (Standard 7), Curriculum (Standard 1), Instruction (Standard 3), and the Academic Index?

Tables 11-14 contain regression results related to this research question. Table 11 details the results of multiple regression analysis to determine the effects of the

Demographic Variables on Leadership. Tables 12, 13, and 14 give the effects of the Demographic Variables on Curriculum, Instruction, and the Academic Index, respectively.

In the multiple regression for the effects of Demographic Variables on Leadership (Table 11), the independent variables include School Size (grades 4 & 5), Percent White, Appalachian, Percent Free and Reduced Lunch, County/Independent district, Percent Disabled, Percent Gifted, and Year Audited. Of the variables considered, only Percent Free and Reduced Lunch yields a significant effect. The model demonstrates a significant relationship between the independent variables and Leadership, $F(8, 172) = 3.72, p < .001$. The Adjusted R^2 of .11 indicates a small effect from the model. The B column indicates that one unit of increase in Percent Free and Reduced would result in about 1.5 units decrease in Leadership, controlling for the other variables in the model. Looking at Betas, a one unit increase in the standard deviation of Percent Free and Reduced would produce a decrease of a third of a standard deviation in Leadership.

Table 11

Regression of Standard 7, Leadership, on the Demographic Variables (N = 181)

Variable	<i>B</i>	<i>SE B</i>	Beta	<i>t</i>	Sig. <i>t</i>
Constant	-91.79	116.503		-.788	.432
SIZE	7.616E-04	.001	.04	.523	.602
%WHITE	-.39	.53	-.08	-.732	.465
%FRED	-1.54	.56	-.33	-2.756	.006
%GFT	.87	.87	.09	.004	.317
%DAB	-.43	1.029	-.03	-.417	.678
APP	.23	.23	.11	.990	.323
COUNTY	.22	.26	.07	.859	.391
YRAUD	4.627E-02	.06	.06	.795	.428

Table 12 presents the regression of Curriculum on the Demographic Variables. Of the variables considered, Year of Audit and Percent Free and Reduced yield significant effects. The model is significant, $F(8, 172) = 2.956, p = .004$. The Adjusted R^2 of .08 indicates that a small portion of the variation in Curriculum is accounted for by the equation. The beta column indicates that a one standard deviation increase in Year of Audit would result in a .20 standard deviation unit increase in Curriculum effect, controlling for the other variables, while a one standard deviation increase in Percent Free and Reduced would effect a decrease of .24 standard deviation units in Curriculum.

Table 12

Regression of Standard 1, Curriculum, on the Demographic Variables (N = 181)

Variable	<i>B</i>	<i>SE B</i>	Beta	<i>t</i>	Sig. <i>t</i>
Constant	-301.06	118.23		-2.547	.012
SIZE	-3.430E-04	.001	-.02	-.232	.817
%WHITE	-.147	.54	-.03	-.273	.785
%FRED	-1.13	.57	-.24	-1.998	.047
%GFT	.41	.88	.04	.463	.644
%DAB	-.77	1.04	-.06	-.734	.464
APP	-4.643E-02	.23	.02	.021	.841
COUNTY	-.10	.26	-.03	-.397	.692
YRAUD	.15	.06	.20	2.554	.012

Table 13 displays the analysis to determine the effects of Demographic Variables on Instruction. Of the variables considered, only Percent Free and Reduced yields a significant effect. The ANOVA for the model is significant, $F(8, 172) = 5.141, p < .001$. The Adjusted R^2 of .16 indicates a small effect for the Demographic Variables on Instruction. The beta of -.25 for the lunch program indicates a negative impact: Instruction (Standard 3) would decrease by a quarter of a standard deviation if the lunch program variable were to increase by a standard deviation.

Table 13

Regression of Standard 3, Instruction, on the Demographic Variables (N = 181)

Variable	<i>B</i>	<i>SE B</i>	Beta	<i>t</i>	Sig. <i>t</i>
Constant	-198.81	113.26		-1.755	.081
SIZE	-1.264E-03	.001	-.07	-.893	.373
%WHITE	6.015E-02	.52	.01	.117	.907
%FRED	-1.16	.54	-.25	-2.143	.034
%GFT	1.34	.84	.13	1.589	.114
%DAB	-.72	1.00	-.05	-.717	.474
APP	-.25	.22	-.13	-1.145	.254
COUNTY	.35	.25	.10	1.390	.166
YRAUD	9.959E-02	.06	.13	1.759	.080

The multiple regression of the Academic Index on the Demographic Variables is presented in Table 14. The ANOVA is significant, $F(8, 172) = 34.16, p < .001$. The Adjusted R^2 of .60 indicates a very strong effect on the Academic Index. Several of the demographic variables produced significant effects: Percent White, Percent Free and Reduced Lunch, County/Independent district, Percent Gifted, and Year of Audit. Controlling for the other variables in the model, Percent Gifted and Free and Reduced Lunch have strong effects with standardized betas of .21 and -.41, respectively. This is interpreted as a gain of .21 and a loss of .41 standard deviation units associated with a one standard deviation unit increase in gifted and lunch program participation. The coding for

County indicates that schools in county districts score higher than schools in independent districts for this data base. The strong beta for Year of Audit indicates that across all of the schools, achievement is increasing for the five years of data.

Table 14

Regression of the Academic Index on the Demographic Variables (N = 181)

Variable	B	SE B	Beta	t	Sig. T
Constant	-7307.06	956.15		-7.642	< .001
SIZE	-1.034E-02	.01	-.05	-.865	.388
%WHITE	9.81	4.36	.16	2.250	.026
%FRED	-23.64	4.57	-.41	-5.172	< .001
%GFT	25.66	7.10	.21	3.612	< .001
%DAB	-6.57	8.44	-.04	-.778	.438
APP	.15	1.87	.01	.081	.936
COUNTY	4.64	2.12	.11	2.187	.030
YRAUD	3.68	.48	.39	7.705	< .001

Research Question 4

To what degree do Curriculum (Standard 1) and Instruction (Standard 3) mediate the effect of Leadership (Standard 7) on the Academic Index, controlling for demographics?

Table 15 combines all the independent variables, presenting the hierarchical multiple regression to determine the effects of Demographic Variables, Leadership, Instruction, and Curriculum on the Academic Index. Demographic variables which had no

significant effect in previous regressions were not included at this point. The ANOVA for the model in all three steps of Table 15 is significant.

Table 15

Regression of the Academic Index on Standard 7, Leadership, Controlling for Demographic Factors and as Mediated by Standard 1, Curriculum and Standard 3, Instruction (N = 181)

Variable	B	SE B	Beta	t	Sig. t
Step 1					
Constant	-7265.87	944.85		-7.690	< .001
%WHITE	10.83	3.14	.18	3.445	.001
%FRED	-22.64	3.01	-.40	-7.514	< .001
%GFT	27.00	6.81	.22	3.964	< .001
COUNTY	4.67	2.08	.11	2.250	.026
YRAUD	3.66	.47	.39	7.752	< .001
Step 2					
Constant	-7002.20	856.85		-8.176	< .001
%WHITE	11.28	2.85	.19	3.962	< .001
%FRED	-17.79	2.83	-.31	-6.279	< .001
%GFT	23.17	6.20	.19	3.740	< .001
COUNTY	3.67	1.89	.09	1.947	.053
YRAUD	3.53	.43	.38	8.243	< .001
Leadership	3.53	.56	.30	6.286	< .001

(table continues)

Table 15. (*continued*)

Variable	<i>B</i>	<i>SE B</i>	Beta	<i>T</i>	Sig. <i>T</i>
Step 3					
Constant	-6332.77	818.72		-7.735	< .001
%WHITE	11.67	2.67	.19	4.369	< .001
%FRED	-15.62	2.69	-.27	-5.798	< .001
%GFT	21.31	5.83	.18	3.653	< .001
COUNTY	3.41	1.79	.08	1.910	.058
YRAUD	3.19	.41	.34	7.803	< .001
Leadership	1.66	.66	.14	2.535	.012
Instruction	2.78	.74	.23	3.753	< .001
Curriculum	.77	.73	.06	1.033	.289

Note. Adjusted $R^2 = .60$ for Step 1; Δ in Adjusted $R^2 = .07$ for Step 2; Δ in Adjusted $R^2 = .04$ for Step 3 ($ps < .001$).

For Step 1, $F(5, 175) = 54.88, p < .001$. The Adjusted R^2 of .60 indicates a large effect on the Academic Index. The first entered demographic controls (Percent White, Percent Free and Reduced, Percent Gifted, County School, and Year of Audit) are all statistically significant at the $p < .05$ level. For Step 2, Leadership (Standard 7) was added to the equation to determine its effect after demographic factors were controlled, with the ANOVA for the model significant, $F(6, 174) = 62.38, p < .001$. This produces an increment in the Adjusted R^2 of .07, to .67. A separate calculation, the full and reduced comparison F test, $F(1, 174) = 39.50, p < .001$, demonstrates the significance of the added

variable. Leadership is significant at the .001 level, but County-Independent district is reduced to just below significance ($p = .053$).

Finally, in Step 3, Curriculum (Standard 1) and Instruction (Standard 3) were added to investigate the extent that these Academic Performance standards mediate Leadership when demographics are controlled. The model for Step 3 results in $F(8, 172) = 56.50, p < .001$ with a further increment in the Adjusted R^2 of .04 to .71. The full and reduced comparison F test again demonstrates the significance of adding the Step 3 variables, $F(2, 174) = 13.01, p < .001$). Notably, the Curriculum variable was not significant; all other variables remained significant but Leadership was reduced to $p = .012$. The very strong effect size indicates that the model accounts for 71% of the variation of the Academic Index.

Beta results indicate the increase in standard deviation units on the Academic Index that a one standard deviation increase in the independent variables would produce. For this final hierarchical model (Step 3), those effects, respectively, are Percent White, .19; Free and Reduced Lunch, -.27; Percent Gifted, .18; Year of Audit, .34; Leadership, .14; and Instruction, .23. This final regression basically confirms the mediated effects model of leadership, with influence through instruction but not curriculum

Supplemental Research Question 1

To what extent are results of factor analysis of the sets of indicators for Standards 1, 3, and 7 consistent with the Leverage Points, Variance Points, and Common Points identified by KDE?

Over the course of the collection of Scholastic Audit data, the Kentucky Department of Education (KDE) has conducted several informal analyses on the relative import of the different indicators for the different standards that comprise the Standards and Indicators for School Improvement (SISI). Specifically, KDE determined which

indicators were most discrepant between high performing schools (meeting accountability goals) and low performance schools (not meeting accountability goals). For the original analysis (2000-2001 data), the state termed these *Leverage Points* (listed in Appendix C). Based on the second round of Scholastic Audits in 2002-2003, KDE found 27 indicators that distinguished between higher and lower academic growth, but renamed them *Variance Points* (Appendix D). The state then compared the two lists for the first two rounds of audits and found six Common Variance Points (see Appendix E). Finally, after two more rounds of audits had been conducted, KDE did another search for indicators that discriminated between high achieving schools and schools not progressing adequately over the entire data set (utilizing somewhat altered criteria for significance) and found 11 Common Variance Points (see Appendix F).

Supplemental Research Question 1 compares these informal analyses by KDE (primarily by visual inspection) to the more formal psychometric analyses done in this dissertation. Because this study examines only Curriculum, Instruction, and Leadership, the comparison is limited to those three standards (1, 3, and 7). In the factor analyses reported in the section above, Psychometric Analysis, for each of these three standards, only one unitary factor was found. In other words, the sets of indicators for each standard held together as a single factor. This contrasts with the findings from KDE's informal analysis, indicating that certain indicators are more significant in their impact on achievement than the others which did not differentiate between higher and lower performing schools. The Appendices list the state's selected points from across all nine improvement standards. For the reader's convenience, points relevant to the three standards of this study are singled out in the following paragraphs.

In the state's first list of differing points (Leverage Points), four of the seventeen

points are common to the standards of this study (Curriculum, Instruction, and Leadership; Standards 1, 3, and 7, respectively). These four study-relevant indicators are listed as follows with the Standard identifier being the first number of the statement:

- 1.1d. There is evidence of vertical communication with an intentional focus on key curriculum transition points within grade configurations (e.g., from primary to middle and middle to high).
- 3.1b. Instructional strategies and learning activities are aligned with the district, school, and state learning goals and assessment expectations for student learning.
- 7.1c. There is evidence that all administrators have a growth plan focused on the development of effective leadership skills.
- 7.1d. There is evidence that the school/district leadership team disaggregates data for use in meeting the needs of a diverse population, communicates the information to school staff and incorporates the data systematically into the school's plan.

After the state's second round of audits a new list of 27 Variance Points (the name was changed), was published. Four of the 27 indicators from the Curriculum, Instruction, and Leadership Standards follow:

- 1.1g. The curriculum provides access to a common academic core for all students.
- 3.1b. Instructional strategies and learning activities are aligned with the district, school, and state learning goals and assessment expectations for student learning.
- 3.1d. Teachers demonstrate the content knowledge necessary to challenge and motivate students to high levels of learning.
- 7.1k. There is evidence that the principal demonstrates leadership skills in the areas of academic performance, learning environment, and efficiency.

Kentucky compared these lists to identify points common to both and published "Six Common Variance Points" in 2003 (Division of School Improvement, 2003). Only one indicator from this list is common to the study standards, from Instruction, Standard

3.

- 3.1b. Instructional strategies and learning activities are aligned with the district, school, and state learning goals and assessment expectations for student learning.

In 2005, Kentucky released a list of 11 Common Variance Points derived from all the previous audits. Five indicators from this list are common to the study and all five are from Leadership, Standard 7.

- 7.1c. There is evidence that all administrators have a growth plan focused on the development of effective leadership skills.
- 7.1e. Leadership ensures all instructional staff has access to curriculum related materials and the training necessary to use curricular and data resources relating to the learning goals for Kentucky public schools.
- 7.1g. Leadership plans and allocates resources, monitors progress, provides organizational infrastructure and removes barriers in order to sustain continuous school improvement.
- 7.1h. The school/district leadership provides the organizational policy and resource infrastructure necessary for the implementation and maintenance of a safe and effective learning environment.
- 7.1k. There is evidence that the principal demonstrates leadership skills in the areas of academic performance, learning environment, and efficiency.

This Supplemental Research Question compares the formal psychometric analyses conducted in this dissertation versus the informal inspection by KDE to determine indicators that distinguish between high and low performing schools. Summarizing, in this study, the factor analyses conducted on the three standards--Curriculum, Instruction, and Leadership--revealed that the sets of indicators for each one represent a unitary factor with high internal reliability (see Tables 3-5 and accompanying text). In contrast, the informal KDE investigations produced sets of individual indicators across the nine Standards and Indicators for School Improvement that differentiated between high performing schools and those not meeting accountability growth goals. (The specific indicators from Standards 1, 3, and 7 were listed immediately above while the entire sets of these

“variance points” are attached at Appendices C-F.)

On the surface, it would seem that this study’s formal findings contradict the informal work by the KDE. However, that is deceiving. For a number of reasons, these were not equivalent analyses. First and most important, the psychometric calculations in this dissertation represent *internal analyses* of the properties of the indicators for each standard. That has *no* relationship to an external criterion such as the Academic Index. (For that comparison see Supplemental Research Question 2, below.) In contrast, the KDE findings are explicitly focused on the relationship of *each separate indicator* to accountability outcomes, with no assessment of the psychometric properties of the sets of indicators. Second, the time frame and samples differed for this study and the four KDE lists of variance points. (This study examined all five years of data and the four KDE lists--Leverage Points, Variance Points, six Common Variance Points, and 11 Common Variance Points--were based, respectively, on the first cycle of audits, the second cycle, the first and second cycles, and all five years.) Third, the samples were different. In the current study, only elementary schools (and only those that were restricted to Grade 4 and 5 data) were included. For KDE, all levels of schools--elementary, middle, and high--with all types of grade configurations were included. Finally, KDE used the Accountability Index while this study used the Academic Index as the criterion.

This comparison represents discrepant findings based on different criteria. Accordingly, there is no intent here to imply that the state’s identification of key indicators is not useful to schools for improvement planning. On the other hand, this study does provide psychometric support for the fact that the indicators for each standard fit well as a single factor. In fact, given that no formal psychometric analyses of Kentucky’s Standards and Indicators for School Improvement have been previously conducted, this

study confirms the integrity of the three sets of indicators for Standard 1 (Curriculum), Standard 3 (Instruction), and Standard 7 (Leadership). Further, the scores are provided by highly trained external audit teams, and the data set represents a sophisticated snapshot of the internal workings of schools compared to the typical school climate research that depends on self reported perceptions. Thus, because of the differences in the context of the respective formal and informal analyses, the findings from this Supplemental Research Question should be viewed as providing additional insight about Kentucky's Standards and Indicators for School Improvement, rather than focusing on the discrepant outcomes of the investigation.

Supplemental Research Question 2

To what extent are results of multiple regressions based on Figure 1 for this study consistent with results of regression analyses based on the Leverage Points, Variance Points, and Common Points identified by KDE?

In Research Questions 1 and 2, simultaneous multiple regression was used to determine the effect of the three standards examined in this study on the Academic Index. Individual regressions were performed for each of the three Standards central to this study: Standard 1, Curriculum; Standard 3, Instruction; and Standard 7, Leadership. For each of these regressions, the indicators for the three standards were collapsed to an overall composite scale, consistent with the psychometric analyses that showed each set of respective indicators represented a single factor (see Tables 9 and 10 and accompanying text). Briefly, both Leadership (Table 9) and Instruction (Table 10) were significant, with Curriculum almost significant ($p = .053$). The two significant regressions explained 26% and 36%, respectively, of the variance on the Academic Index.

In contrast to these previous results, additional regressions were conducted for this Supplemental Research Question. Despite the fact that the psychometric analyses

demonstrated that the sets of indicators for the three standards constituted a single factor (the basis of Tables 9 and 10), there is the possibility that not all of the indicators for a specific standard have an equal influence on an external criterion such as achievement. In other words, do certain of the indicators “drive” the measured effect on the Academic Index more so than others. (This question is really commensurate with the informal investigations that KDE did to see if certain indicators [“variance points”] distinguished between high performing schools and those not meeting growth targets.)

In order to assess this, three new simultaneous regressions were performed. For each, the set of indicators for a standard were entered as separate independent variables with the Academic Index as the dependent variable. The complete results of these computations are presented in Tables H1-H3, Appendix H. A brief discussion follows.

Multiple regression for the Curriculum Indicators on the Academic Index is presented in Table H1. The ANOVA is significant, $F(7, 173) = 15.03, p < .001$. The Adjusted R^2 of .35 indicates a modest effect on the Academic Index. Controlling for the other indicators in the model, three of the seven Curriculum Indicators were significant at the $p < .05$ level, as follows:

- 1.1d. There is evidence of vertical communication with an intentional focus on key curriculum transition points within grade configurations (e.g., from primary to middle and middle to high).
- 1.1e. The school curriculum provides specific links to continuing education, life and career options.
- 1.1g. The curriculum provides access to a common academic core for all students.

The strongest effect is produced by 1.1d, with a standardized beta of .35, a gain of about a third of a standard deviation in the Academic Index associated with a one unit increase in indicator 1.1d. The other two indicators, 1.1e and 1.1g, yield betas of .23 and .26,

respectively.

The influence of the Instruction Indicators on the Academic Index was also significant, $F(2, 178) = 51.31, p < .001$, with an effect size of 38%, slightly more than one third of the variation in the Academic Index. Within the model, four of the eight Instruction Indicators were statistically significant at $p < .05$. The four significant indicators are listed here for the reader's convenience. The complete regression table may be viewed in Appendix H, Table H2.

- 3.1b. Instructional strategies and learning activities are aligned with the district, school, and state learning goals and assessment expectations for student learning.
- 3.1d. Teachers demonstrate the content knowledge necessary to challenge and motivate students to high levels of learning.
- 3.1e. There is evidence that teachers incorporate the use of technology in their classrooms.
- 3.1f. Instructional resources (textbooks, supplemental reading, technology) are sufficient to effectively deliver the curriculum.

The raw coefficient *B* column indicates that a one unit increase in the Indicators produces gains in the Academic Index of 1.53, 1.45, 1.55, and 1.27 units, respectively. A puzzling finding is that Indicator 3.1g is nearly significant ($p = .066$) but has a negative effect (3.1g: Teachers examine and discuss student work collaboratively and use this information to inform their practice).

Finally, Table H3 presents the simultaneous regression of the Academic Index on the 11 Leadership Indicators. The ANOVA is significant, $F(11, 169) = 6.076, p < .001$ with 24% of the variance in achievement explained. In the model only one of the Standard 7 indicators is significant, at $p = .046$ (7.1j: There is evidence that the SBDM (Site Based Decision Making) council has an intentional focus on student academic performance). The

standardized beta of .20 is the amount of standard deviation change on the Academic Index associated with a one standard deviation change in indicator 7.1j.

In 2005, Kentucky released a set of 11 Common Variance Points for the nine Standards and Indicators for School Improvement identified over the entire 5-year audit history. These points are listed in Appendix F. Of the 11 points identified, five of these common indicators are derived from the standards considered in this study (Standard 1, Standard 3, and Standard 7). In fact, all five are Indicators from Standard 7 (Leadership). Standards 1 and 3 had no Indicators listed in the state's 11 Common Variance Points. The five Indicators from the Leadership Standard are listed as follows:

- 7.1c. There is evidence that all administrators have a growth plan focused on the development of effective leadership skills.
- 7.1e. Leadership ensures all instructional staff has access to curriculum related materials and the training necessary to use curricular and data resources relating to the learning goals for Kentucky public schools.
- 7.1g. Leadership plans and allocates resources, monitors progress, provides organizational infrastructure and removes barriers in order to sustain continuous school improvement.
- 7.1h. The school/district leadership provides the organizational policy and resource infrastructure necessary for the implementation and maintenance of a safe and effective learning environment.
- 7.1k. There is evidence that the principal demonstrates leadership skills in the areas of academic performance, learning environment, and efficiency.

These 11 Common Variance Points from KDE's (2006f) analysis of the entire Scholastic Audit data set (and the five just listed that come from Standards 1, 3, and 7-- actually only Leadership) are in many ways comparable to the results of the three regressions reported for this Supplemental Research Question (Tables H1-H3). Both cover the entire five years of audits and both represent the relationship between individual indicators and accountability outcomes.

Yet, Tables H1-H3 yield a total of eight significant indicators based on these supplemental regressions (three from Curriculum, four from Instruction, and one from Leadership, as listed above). There is *no* overlap between these informal discrepancy-based investigations by KDE and the formal multiple regressions conducted for the Supplemental Research Question. The one significant indicator from Table H3, 7.1j, is not among the five Common Variance Points from Leadership (Standard 7) found by KDE. But as was the case for Supplemental Research Question 1, other differences between the KDE work and the current study are germane: namely, all schools (KDE) versus only elementary schools that are limited to Grade 4 and 5 data (this dissertation). Further, KDE utilized the overall Accountability Index whereas this research was based only on the Academic Index which is a subset of the Accountability Index (albeit, approximately 90% the larger measure). Presumably these differences in methodology could account for the discrepant findings.

Finally, another set of analyses was conducted for this Supplemental Research Question, in order to compare KDE's 11 Common Variance Points to the results of this study. Of the 11 Common Variance Points, five were from the three standards examined in this study (Indicators 7.1c, 7.1e, 7.1g, 7.1h, and 7.1k, as listed above). When the Academic Index was regressed on these five Indicators, only one of the Indicators (7.1g) proved significant at $p = .029$. Table 16 displays this analysis. The ANOVA for the model is significant, $F(5, 175) = 10.585, p < .001$. The Adjusted R^2 of .21 indicates a small effect on the Academic Index. The beta of .26 for Indicator 7.1g indicates a positive impact, an increase of about a quarter of a standard deviation if the indicator variable were to increase by a standard deviation. It is interesting to note that while the single significant Leadership Indicator that emerges from this regression based on the KDE results (7.1g) is *different*

from the single significant Leadership Indicator that was found in Table H3 for this Supplemental Research Question (7.1j), the effect size is similar: .21 (KDE, Table 16) versus .24 (SRQ2, Table H3). Thus the overall influence on achievement seems to be the same regardless of the source from which the final significant indicator is derived.

Table 16

Regression of the Academic Index on the Five Indicators for Leadership, Standard 7 (N = 181)

Indicators	<i>B</i>	<i>SE B</i>	Beta	<i>t</i>	Sig. <i>t</i>
Constant	-51.44	2.08		-24.700	< .001
7.1c	.75	.47	.13	1.593	.113
7.1e	.43	.62	.07	.682	.496
7.1g	1.64	.75	.26	2.197	.029
7.1h	.33	.60	.05	.546	.585
7.1k	.94	.61	.16	1.526	.129

Summary

This chapter presented findings related to the core research questions regarding the effects of demographic variables, Leadership, Curriculum, and Instruction on Kentucky elementary school accountability results (Academic Index). Two supplemental research questions add to the study, comparing results of the Kentucky Department of Education’s preliminary search for influential factors in school improvement in the Scholastic Audit data base to the more formalized multiple regressions conducted for Research Questions

1-4. Secondary analysis of data collected by Kentucky's Scholastic Audit teams over a five-year period (2001-2005) established the parameters of the study. The procedures included descriptive statistics, psychometric analysis, and both simultaneous and hierarchical multiple regression. The Scholastic Audits are based on the nine Standards and Indicators for School Improvement (KDE, 2004d), with standards 1, 3, and 7 the target of this investigation.

After the data from different sources were combined and checked for missing or out of range values, descriptive statistics for the background factors were calculated. Included in the study were School Size, Percent White, Appalachian, Percent Free and Reduced lunch, County/Independent district, Percent Gifted, Percent Disabled, and Year of Audit. The focal dependent variable, Academic Index, is comprised of KCCT scores generated in fourth and fifth grades for the schools in this study. The study was confined to Kentucky elementary schools containing these two grades, with irregular school models such as P-3 or P-8 not included. The primary model for Kentucky elementary schools is P-5, although several of the schools include grade six. This selection process produced a net sample of 181 schools from the population of approximately 760 elementary schools in the state, with the demographic variables for this study based on grade 4 and 5 information. This procedure provided a match between the school demographic data and the grades that contribute to the school's Academic Index.

Factor analyses were conducted on the three sets of indicators that are part of this study. Subsequently, Cronbach's alpha was conducted to examine the internal reliability of the factors resulting from these computations for each of the three standards investigated. These analyses resulted in a single factor emerging for each standard. Cronbach's coefficient alpha computed on these single factors yielded an overall

composite value of .915, .872, and .857, respectively, for the Leadership, Curriculum, and Instruction standards. These results reflect an exceptional degree of internal reliability and confirm the factor analysis. The means and standard deviations for both the individual items and the composite scales similarly reflected solid psychometric properties.

Multiple regression analyses tested the study model presented in Figure 1, page 16, following the sets of variables and type of regression identified in Table 1, page 94. The demographic factors had a small influence on the three standards examined in this study (Leadership, Standard 7; Curriculum, Standard 1, and Instruction, Standard 3), with effect sizes ranging from .08 to .16. The influence of the demographics on the Academic Index was much stronger (effect size of .62). Leadership had a modest influence on both Curriculum and Instruction (effect sizes of .35 and .36, respectively) and a somewhat smaller direct impact on the Academic Index (.26 effect). The two Academic Performance standards accounted for 36% of the variance on the Academic Index but only Instruction was statistically significant. When the final hierarchical regression was computed (the influence of Leadership on the Academic Index, controlling for demographic factors and as mediated by Curriculum and Instruction), 71% of the variance on the Academic Index was explained, a very strong effect.

With regard to the supplemental research questions, the study reveals some surprising insight for elementary school consideration. The Variance Points identified by KDE in general, across all grades (K-12), differ from the points identified as most significant in this study. This is not to say that KDE's points are wrong; rather the procedures utilized by KDE and in this study were not the same, with differences in the subsamples for different time frames, the criterion measure utilized, grade level, grade configuration, and methods of analyses. All of these differences in approach presumably

account for why the indicators that emerged from KDE's analyses did not match the indicators that emerged from the Supplemental Research Questions for this study.

The overall results of the analyses conducted for this study confirm the influence of the central research question, i.e., controlling for demographic factors, what is the effect on accountability outcomes of Leadership as mediated through Curriculum and Instruction? With an effect size of .71 for this hierarchical regression, these findings emphasize the role of Leadership as elementary schools address school improvement, filtered through efforts in Instruction (but not Curriculum). More specifically, these results confirm the work of Murphy (2004) and other theorists, that a mediated effects model best describes the mostly indirect influence of the principal on achievement outcomes.

CHAPTER V

DISCUSSION AND CONCLUSIONS

Introduction

Kentucky stepped to the forefront of American education with its comprehensive KERA legislation in 1990. As the standards and accountability movement swept the nation throughout the 1990s, Kentucky refined its reform effort and continues to evolve in bringing improvement to all schools and all school population sub-groups. Of particular interest in this study is the state's unique effort to extend the curriculum-based standards movement to whole-school reform by identifying standards and indicators that serve as the basis of school improvement. As a part of this process, Kentucky has developed a means of auditing schools in accordance with the new standards, providing support to struggling schools, and strengthening instructional leadership. The local school principal's role in this process frames the overall study purpose.

Within the context of reform and accountability, Kentucky has undertaken a significant initiative in developing and adopting standards for school leaders. Although Kentucky adopted the ISLLC Standards for its principals (Council of Chief State School Officers, 1996), the Kentucky Department of Education (2004d) went beyond that to develop a set of Standards and Indicators for School Improvement that are to guide schools in their quest to increase student achievement. Scholastic Audits (Division of School Improvement, 2003) are based on the SISI framework and provide a profile of a school's current status under the headings of Academic Performance (Standards 1, 2, & 3),

Learning Environment (Standards 4, 5, & 6), and Efficiency (Standards 7, 8, & 9).

Presumably, it is the cumulative effect of all the standards that yields whole-school improvement and high student academic achievement. Scholastic audit and review teams from the state offer recommendations and next steps to improve school performance. Commendations are also offered when the indicators of a particular standard are evaluated as being exemplary.

Kentucky principals are accountable for meeting a broad range of high-stakes expectations including the nine SISI domains, ISLLC Standards, NCLB requirements, and other policy mandates, all directed toward school improvement. While Kentucky principals must be cognizant of these overlapping sets of standards, the primary thrust of performance appraisal is value-added growth in student achievement on the Commonwealth Accountability Testing System (CATS). Leaders need information on what works and which strategic efforts provide the greatest return for effort invested. For example, there are nine standards in the SISI document. Are these equally efficacious? Or are there “pressure points” that represent key leverage for leaders?

One source of evidence on this issue is the data on school Scholastic Audits that have been performed. The KDE has found selected Leverage Points based on preliminary analysis of this data (Division of School Improvement, 2003). But these findings examine each of the nine standards separately and are generalized from across all grades (Primary-12). There has been no research to date that attempts to examine these standards or some subset thereof simultaneously for their comparative effect on achievement. Nor have there been any efforts to examine these data with respect to demographic background or theoretical linkages among these nine standards. In addition to investigating the aforementioned issues, this study focuses at the elementary level. The isolation of

elementary data provides a more finely tuned report of where elementary leadership should direct its attention.

This study provides an intense look at the state's improvement model, using an extensive volume of data collected by the KDE within both struggling and successful schools over a 5-year period. Findings add important insight for understanding dynamics related to both leadership and effects in low-performing schools. Low performing schools remain a roadblock for America's accountability movement and Kentucky's improvement model may well be opening the door for successfully addressing this issue. To succeed in this element would be to claim a goal espoused in concept but rarely in reality. The study explicates the value of Kentucky's Scholastic Audit procedures, providing a refined picture of school leadership and the impact of selected standards. Specific needs within the elementary portion of the model are exposed and compelling factors for elementary school leaders are clarified.

Following is the central research question for this study: Based on Scholastic Audits, what are the effects of Leadership, Curriculum, and Instruction on Kentucky accountability scores? Accordingly, a quantitative analysis of secondary audit data addresses these issues. Although state audits contain information on all nine standards, this study examines only the relationships among three--Standard 7 (Leadership), Standard 1 (Curriculum), Standard 3 (Instruction)--and their effect on school accountability scores (Academic Index), while controlling for demographic background factors at the elementary school level. The emphasis is on the influence of leadership as mediated through curriculum and instruction.

This chapter concludes with a brief overview of the study, discussion and analysis of the findings, recommendations, and conclusions. The state's Scholastic Audit process

and the resulting data from the innermost sanctuaries of education--local schools and classrooms--shed light on school reform, accountability, and principal leadership. The study represents the first formal analysis of the Scholastic Audit data compiled by the Kentucky Department of Education. As such, it taps into the rich, fertile mine of the nation's only Scholastic Audit database (Alabama has recently adopted the SISI and Scholastic Audit process and 11 other states are interested, but as of this writing, this is the only developed data set). Rarely do researchers get such an in-depth picture from within the school.

The Study in Brief

Kentucky's Educational Reform Act of 1990 opened the door for the state to address seriously the need for reform. Major steps were needed and taken to extricate the Commonwealth from its tradition of lagging far behind other states in almost every measurable educational category. It was a significant beginning but as the Pandora's box unfolded, leaders soon acknowledged the need for continuous improvement. The state's current accountability goals culminate with each school attaining a specified achievement by the year 2014--Proficiency in all schools, a very high level (cf. Petrosko, 2000; Rothstein, 2004). However, the state has been engaged in an on-going effort to bolster key elements of school success since KERA began. What has changed recently is the formalization of standards geared to whole school reform and a process for monitoring school progress: the Scholastic Audit, keyed to the indicators of the nine standards.

The research conducted in this study is a quantitative analysis of secondary data made available from the Kentucky Department of Education and based on the Scholastic Audits. Data were analyzed to examine the effect of Leadership (Standard 7), Curriculum (Standard 1), and Instruction (Standard 3) on CATS scores (the Academic Index) in

Kentucky elementary schools. Relationships among certain demographic factors and student achievement were also investigated. Multiple regression was used to analyze data available through Kentucky audits of both successful and struggling schools. The audits provide the scores for Leadership, Instruction, and Curriculum.

Research indicates that socioeconomic factors in the school and community appear to influence principal leadership and its impact on school effectiveness. The literature is filled with the significance of demographic factors where school success is an issue. In this study, this dimension is embedded in the current high-stakes, accountability environment. More specifically, demographic factors are incorporated into the Scholastic Audit database for their effects on Leadership (principals), Curriculum, and Instruction with respect to CATS accountability outcomes. The particular demographic controls (obtained from Kentucky Performance Reports) include School Size (for this study's purpose, the number of students in grades 4 and 5), Percent White, Percent Free and Reduced, Percent Gifted, Percent Disabled, Appalachian, County (as opposed to independent districts), and Year of Audit.

Simultaneous and hierarchical regression analyses were conducted to investigate possible relationships among the study's variables. Certain descriptive statistics were generated in the process of conducting the regression analysis. The logic of the study design follows Figure 1, p. 16. There are three types of independent variables--Demographic, Efficiency, and Academic Performance. The categories for Efficiency and Academic Performance are derived from the three groupings of Standards in the SISI model. Leadership in particular is closely connected to the other two standards and of focal interest in this study. Theoretically, leadership is conceptualized as a mediated effects model (Hallinger & Heck, 1998; Murphy, 2004) in which the effects of principals

are less direct than filtered through (mediated by) their influence on staff to interpret curriculum and deliver instruction in the classroom setting (cf. Lockwood, 1994).

Academic Index scores are identified as the dependent variable. The combination of these factors weighs heavily in Kentucky's high-stakes accountability and evaluation of school effectiveness.

All variables were defined operationally, organized by the groupings for the independent variables (Demographic Controls, Efficiency, and Academic Performance) and the dependent variable. The sample was composed of 181 Kentucky elementary schools that have been audited over the past five years (2001-2005). Most of the schools had required audits because of low performance scores, but some are successful and high performing, volunteering to gain insights regarding improvement.

Descriptive statistics were then reported for the demographic factors and Academic Index, a snapshot of these variables at the time of this study. Kentucky's Standards and Indicators for School Improvement represent its guide to helping schools progress. For each of the nine standards, there are from 6-15 indicators, over 80 in all. These indicators constitute the conditions that are assessed by the state teams during the Scholastic Audit. Each of the indicators is scored on scale of 1-4 with a score of 1 being "little or no development or implementation" and 4, "exemplary level of development and implementation." However for this study, the scale was converted to a 0, 2, 5, 7 ratio to reflect the more difficult transition from the second to the third level of performance, as reported by KDE staff. (This parallels the larger step from Apprentice to Proficient in the state's four levels of student achievement, which also has the same 0, 2, 5, 7 ratio.)

Because KDE had done no formal psychometric analysis of these indicators, factor analysis was performed on each set of indicators for the three standards in this study,

followed by Cronbach's coefficient alpha on the resulting factors. Multiple regressions were then conducted to answer the research questions that followed the relationships laid out in Figure 1. Finally, approval of the study was obtained from the offices for human subjects research at the University of Louisville and Western Kentucky University.

Discussion

In the discussion that follows, the major sections of Chapter IV--Descriptive Statistics, Psychometric Analyses, and specific Research Questions--are treated separately. For each, the findings are briefly recapitulated and then analyzed by addressing the contribution of this study to the empirical research base. Discussion related to the larger purpose of the study is reserved for the Conclusions section of this chapter.

The literature review for this study reveals that most of the research germane to Kentucky's high-stakes accountability environment has focused on achievement trends generally (cf. Education Trust, 2001; NAEP, 2003; Poggio, 2000; Prichard Committee for Academic Excellence, 1999), effects of demographic factors on accountability outcomes (e.g., Guskey, 1997; Lyons, 2004; Miller & Moore, 2006; Moore, 2003; Roeder, 1999, 2000, 2001), studies of school climate (e.g., Lumsden, 1999; Shutt, 2004), or studies that focus on some type of curricular issue such as the Primary Program (Luvisi, 2000) or middle school science (Ennis, 2002).

What is obvious in this body of work is the lack of empirical research specific to the means by which school leaders effect accountability outcomes. Specifically how principals influence outcomes remains unclear (Hallinger & Heck, 1998). Washington (2002) examined feminine leadership in her study of Kentucky female superintendents, but did not examine achievement outcomes directly. Some work has been done to examine connections between principals and measures of student performance

(instructional leadership) but little is known about how effective principals implement particular practices or the degree of progress in equipping principals with the skills needed for the task (Murphy, 2004). Thus, the research clearly indicates the need for more focused investigation of the effects of leadership on achievement outcomes, particularly under the high-stakes accountability conditions. This study provides just that, examining leadership in the context of a mediated effects model, based on Kentucky's Scholastic Audit data set. Because the audits are derived from the Standards and Indicators for School Improvement (Kentucky is the only state which has extended the standards-based curriculum movement to whole-school reform), this research is unique in the United States.

Descriptive Statistics

Descriptive statistics were reported for all demographic data, school audit responses, and school achievement scores. This includes demographic factors (School Size, Percent White, Percent Free and Reduced, Percent Gifted, Percent Disabled, Appalachian, County versus Independent district, and Year of Audit), and the dependent variable--Academic Index. Descriptives for the Leadership, Curriculum, and Instruction standards are included in the section below.

Some clarification is in order for the demographic factors, as reported in Kentucky's School Performance Reports (KPR). For example, School Size with reference to this study is actually based on the number of students in grades 4 and 5 since these students generate the test scores for the elementary school Academic Index. Other demographic information for this study are also based on students in grades 4 and 5. This decision allows the researcher to match the demographic data set with the parameters of the dependent variable. Thus, any generalization to the whole school would assume that

students in grades 4 and 5 would be a fair representation of the entire school.

Analysis

Eighty-four percent of the students in audited schools were white. This figure is consistent with KDE's (2007) website, which lists Kentucky schools at 84.8% white. The population for this study consists of 61% free and reduced lunch participation. This figure is higher than the statewide average of about 50% (Miller, Smith, & Ennis, 2006) and likely due to the fact that at-risk schools constitute the larger portion of audited schools. It follows that these lower performing schools have a tendency toward greater socioeconomic disadvantage. This socioeconomic disadvantage for audited schools is a formidable challenge, especially when coupled with the steeper goal line to 2014 for schools with lower baselines or starting points. For example, a successful school could have started the goal line at 70 and must achieve 100 by 2014. A disadvantaged school could have started at 40 and must achieve the same end of 100 by the same date, 2014. This procedure requires schools with the most challenge to make a larger annual progress. Successful schools in this sense actually are challenged less; some have claimed this to be a lowered expectation (Moore, 2003). Such factors, coupled with an analysis of trend lines for schools with varying SES levels, have led to the prediction that not all Kentucky schools will reach the 2014 proficiency goal (Roeder, 2001).

Percent Gifted in the study (14%) is close to the statewide rate (16.6%), a figure derived from KDE (2007) numbers. This represents one more hurdle for struggling schools, as they tend to have fewer gifted students (see below on the powerful positive effect of Percent Gifted on the Academic Index). Forty percent of the schools are in the Appalachian region but as the study unfolds, this factor is not significant. The proportion of students with disabilities in the study is consistent with statewide proportions. Percent

Disabled is 15% as compared to the state mean of 13%. This demographic factor does not pan out as significant in subsequent calculations but is nonetheless a factor in the use of school resources, as special education guidelines demand a considerable amount of staff and principal time. For example, in the researcher's experience, principals may be required to participate in ARC (Admissions and Release Committee) meetings on a near daily basis. In the study, schools in county systems perform better than schools in independent districts. This is likely more a product of socioeconomic factors than affiliation with the title or organization of districts.

Psychometric Analysis

Psychometric analysis for the study involved the application of both factor analysis and Cronbach's (1951) coefficient alpha. Factor analysis was conducted on the set of indicators for each of the three standards (Leadership, Curriculum, and Instruction). These indicators play a key role in Kentucky's school improvement model, yet to the researcher's knowledge no empirical work exists to verify the extent that the respective indicators in each standard represent some unitary latent construct. Results of this analysis confirm Kentucky's effort to design a coherent set of indicators for the three standards investigated. Confirmation of the factor structure of the indicators for the other six standards is beyond the scope of this study.

Factor analysis of the three sets of indicators considered in this study demonstrated that a single factor represented each Standard. For Leadership, this factor explained 54.6% of the variance among the indicators. Similarly, a lone factor explained 56.9% of the variance for Curriculum indicators and 51% for Instruction indicators. When Cronbach's alpha was calculated to assess scale reliability, an exceptionally high degree of internal reliability was revealed for all three standards. Both individual items and composite values

indicated good psychometric properties.

Analysis

Kentucky's Leadership Standard is measured by 11 indicators; these items produced a .915 coefficient alpha value for the composite scale. The Curriculum Standard, framed by seven indicators, produced a composite alpha of .874. Defined by seven indicators, the Instruction Standard produced a composite .857 alpha. Because these standards and their respective indicators are the basis of the Scholastic Audits and concomitant efforts to assist Kentucky schools, the psychometric properties identified here lend considerable support to the integrity of the Standards and Indicators for School Improvement, at least for the three analyzed. If these standards and indicators are the quintessential guide for Kentucky schools in their quest to increase student achievement, it is important that their psychometric properties be verified.

Research Question 1

To what degree does Leadership (Standard 7) affect Curriculum (Standard 1), Instruction (Standard 3), and the Academic Index?

Three separate simultaneous regressions were utilized to answer Research Question 1. The first established the effect of Leadership on the Academic Index. The second and third regressions determined the effect of Leadership on Curriculum and Instruction. Tables 7, 8, and 9 presented in Chapter IV detail the findings. Leadership has a significant effect on all three variables with $p < .001$ in each case, explaining 35% of the variance in Curriculum, 36% for Instruction, and 26% for the Academic Index.

Analysis

Maintaining an engaging and comprehensive curriculum is an important task of Leadership (Anthes, 2002). An initial step in accountability models across the nation is the

alignment of curriculum with accountability goals. Successful schools seem to have successfully grasped this procedure early in reform initiatives. This study indicates that Leadership plays a significant role in guiding Curriculum decisions; results demonstrate that this variable explains almost 35% of the variation in Curriculum, a fairly large effect and clearly important as an instructional leadership skill. The implication here is that principals do effect Curriculum decisions. Further, as instructional leaders, the ability to do this effectively can have profound consequences on achievement goals. Curriculum frames instruction which is a powerful factor in achievement. In this study, Kentucky elementary principals seem to be using this indirect route to influence what content is delivered, confirming the reality of curricular expertise as an important tool of instructional leadership.

Likewise, leadership yields a significant effect on Instruction; results indicate this variable explains about 36% of the variation in Instruction. This powerful influence provides an indirect avenue for principal impact on accountability scores. In the literature, instruction has consistently been shown to have a strong effect on achievement outcomes (Murphy, 2004; Owings et al., 2005). Some experts insist that not only does good teaching (instruction) improve learning and performance significantly for all students, but also that it may be an especially important factor with respect to positive results for disadvantaged children (cf. Berliner, 1983; Darling-Hammond, 2004; Ingersoll, 2003; Roeder, 2000). Instruction is, therefore, an important means (perhaps the most important) through which Kentucky elementary principals could indirectly impact accountability scores. What this study confirms is that principals indeed do affect the instruction in their schools. That is an important finding because much of the instructional leadership literature posits the importance of this dynamic (e.g., Murphy et al., 1983), although direct empirical evidence

for the practice is much less common (see Waters, Marzano, & McNulty, 2005).

This study confirms the findings of Owings et al. (2005) and the theoretical work by Murphy (2004). Leadership produced a significant effect on the Academic Index, explaining about 26% of the variation. The means by which this influence occurs continues to lack clarity in the literature to this point. Yet, it is clear from this study that Kentucky elementary principals' instructional leadership is channeled through both curriculum and instruction, with Standard 3 (Instruction) a significant means for improvement and Standard 1 (Curriculum) almost significant. That empirical finding is noteworthy for two reasons. First, it reinforces the potential for better outcomes for struggling schools due to the instructional leadership efforts of principals. The fact that slightly more than one third of the variation in the Instruction Standard is associated with the Leadership Standard is remarkable indeed. Second, this confirms the unique potential of the Scholastic Audit to provide an inside look at how schools function, particularly the link between leadership and the heart of any school--curriculum and instruction.

Research Question 2

To what degree do Curriculum (Standard 1) and Instruction (Standard 3) affect the Academic Index?

Simultaneous regression was used to analyze the effect of Curriculum and Instruction on the Academic Index. Instruction yields a significant effect while Curriculum has a near significant effect ($p = .053$). Together these variables explain almost 36% of the variation in the Academic Index. As the study unfolds, Instruction is clearly the more powerful influence on scores. Principals with instructional leadership ability have a powerful, even though largely indirect, opportunity to effect positively school success. (Findings previously discussed for Research Question 1 revealed that

leadership contributes 36% of the variance in Instruction.)

Analysis

Certainly, schools should place a high priority on instruction. The wider literature overwhelmingly supports the conclusion that quality of instruction impacts achievement (cf. Berliner, 1983; Darling-Hammond, 2004; Ingersoll, 2003; Schlechty, 2001; Weiss & Pasley, 2004). This study confirms that Kentucky's directives surrounding instructional leadership are on track for school improvement. Of course, teachers are a key factor in instruction and the degree that principals support the hiring and development of high quality staff can have a huge influence on school improvement (Darling-Hammond & Sykes, 2003; Hale & Moorman, 2003; Winter & Morgenthal, 2001).

In this study the raw unstandardized *B* coefficient for Instruction indicated that with a one unit change in Instruction, the Academic Index would increase by 5.88 units. Thus the study confirms the strong significance of Instruction for school improvement contributing 36% of the variance on the Academic Index. Although this is a strong effect, one may still question whether instruction is changing at a quick enough pace to help schools across the state reach the challenging goal of school Proficiency (100 on a 140-point scale) by 2014, particularly for those serving at-risk populations (cf. Miller & Moore, 2006; Roeder, 2001).

Perhaps more important, despite the extensive literature on the importance of instruction, that research is essentially based on micro-level studies. Almost never are investigations into the quality of instruction conducted with statewide data, or within the context of high-stakes accountability. Ennis' (2002) study of teachers' instructional strategies for middle school science in Kentucky is a notable exception, confirming the importance of enquiry-based practices and denoting the surprisingly strong negative

effects of computers as an approach to science. But the Ennis study was based on students' perceptions of what teachers did, *not* direct observation of actual classroom practice. In contrast, the Scholastic Audit teams are externally trained by KDE, spend time in classrooms, and engage in extensive interviews with school staff so that the data from these audits constitute a rich window into the internal processes of schools and the teachers in them.

Research Question 3

To what degree do Demographic factors affect Leadership (Standard 7), Curriculum (Standard 1), Instruction (Standard 3), and the Academic Index?

This research contributes to the understanding of the interaction of demographic factors and student achievement and informs evaluation of accountability systems and processes. The study provides a statistical analysis of the extent of relationships between demographic factors and achievement as well as the direct effects on Curriculum, Instruction, and Leadership. Results indicate that demographic variables play an important role in a school's Academic Index, concurring with extensive research findings in the literature review. Of the eight demographic variables in the study, five were significant, including Percent White, Percent Free and Reduced Lunch, County versus Independent School districts, Percent Gifted, and Year Audited. The demographic variables had less influence on the three standards. Only Percent Free and Reduced Lunch yielded a significant effect on Leadership, with beta values indicating a slight decrease in the Leadership effect as Percent Free and Reduced Lunch populations increase. When analyzing Demographic effects on Curriculum and Instruction, little effect was noted.

Analysis

The slight negative effect of Demographic factors on Leadership is not yet clearly

explicated by existing research. One possibility for this finding may be the propensity for disadvantaged schools to be stuck with lower performing principals, and for effective principals to migrate away from struggling schools. Considerable research reveals that the best principals (and teachers) gravitate toward the more advantaged, higher achieving schools (Boyd et al., 2003; Darling-Hammond, 2004; Darling-Hammond & Sykes, 2003; Owings et al., 2005). Another explanation worthy of consideration is the fact that principals may very well need to adjust leadership to fit the disadvantaged environment (see Hallinger & Murphy, 1985), i.e., what works and how differs across schools from varying socioeconomic levels. Chronic low performance is often coupled with large numbers of low-income, transient, and special needs students, plus low parent involvement. For example, the principal may need to focus more on the immediate physical and emotional needs of children, placing such things as Academic Index scores in a more long-term context.

Demographic variables seem to have little effect on Curriculum. Only 8% of the variance in Curriculum is explained. Percent Free and Reduced and Year of Audit produce a significant effect, indicating that schools are adjusting Curriculum as the 2014 deadline for Proficiency looms ever nearer. This yearly effect on Curriculum implies that principals and teachers are paying more attention to what they are to teach as the pressures for school improvement increase.

Demographic variables also have a small negative effect on Instruction, explaining nearly 16% of the variance. Again, Percent Free and Reduced (standardized beta effect of $-.25$) and Year of Audit (beta = $.13$) were significant factors. This confirms other research that disadvantaged schools suffer from a significant negative impact on instruction (cf. Berliner, 1983; Darling-Hammond, 2004; Ingersoll, 2003; Miller et al., 2006; Roeder,

2000). A reminder may be in order here: most of the data reviewed in this research is composed of audits from struggling schools.

The most significant regression related to this research question looked at the effect of Demographic factors on the Academic Index. The five demographic variables listed above explained nearly 60% of the variation on this accountability outcome. As might be expected, Percent Gifted is strongly beneficial to school scores, Percent Free and Reduced is strongly detrimental, and Percent White continues to be an important factor. At least among the schools audited, this supports the general literature (see Jencks & Phillips, 1998; Miller, 1995), that more work is needed in Kentucky to reduce performance gaps across these groups of students. Of note is the fact that the year of the audit is one of the stronger influences on the Academic Index, an indication of continued progress for schools across the state of Kentucky, and clearly a product of the KERA reforms. Unfortunately, this improvement on the excellence dimension does not seem to be matched by similar progress on the equity dimension (cf. Miller & Moore, 2006; Roeder, 2001).

Three demographic factors had no influence on any aspect of this study, neither the Academic Index nor the three standards. This is somewhat unexpected for school size and Appalachian status since previous research has implicated both size and Appalachian region (Smith, 2005, 2006) as influential on school outcomes. Perhaps even more surprising, Percent Disabled did not produce significant results, given that schools in the study ranged from 3% to 51% disabled. Further, disability consistently is associated with lower achievement, a finding that holds for large scale accountability studies (cf. Moore, 2003). Kentucky includes all disabled students in accountability testing but these students are allowed modifications, a practice that could very possibly play a role in reducing the

disadvantage among schools with higher percentages of these students in this study. In contrast, Moore notes that there has been little previous analysis of the effects of giftedness on CATS assessments. This study, however, demonstrated that this factor was significant for this Scholastic Audit data base, confirming Moore's findings for giftedness in her analyses.

Research Question 4

To what degree do Curriculum (Standard 1) and Instruction (Standard 3) mediate the effect of Leadership (Standard 7) on the Academic Index, controlling for demographics?

Hierarchical multiple regression was used in answering Research Question 4. Demographic variables that had not produced significant results previously in the study (School Size, Percent Disabled, and Appalachian) were not included in this analysis. In step one of the regression, Demographic factors account for 60% of the variance in the Academic Index. In step 2, the Leadership variable contributes an additional 7%; when step 3 was entered, Curriculum and Instruction contributed another 4%. When all the significant variables of the study were combined, the study model demonstrated a significant relationship between the independent variables and the Academic Index, explaining 71% of the variation of the Academic Index, an exceptionally high effect size. Within the model, the Demographic factors (Percent White, Percent Free and Reduce, Percent Gifted, County School, Year of Audit), Leadership, and Instruction are statistically significant at the $p < .05$ level.

Analysis

As expected, Demographic factors play a key role in achievement. The Percent White influence continues to demonstrate a discernable gap in achievement compared to minorities. This continued failure to achieve equity remains a concern for all educators

and is also a red flag with respect to both NCLB and KERA. Percent Free and Reduced is perhaps the most powerful factor in this study, though not central to the study's purpose. This variable has a long, well-documented history of significance in educational research (e.g., Guskey, 1997; Lyons, 2004; L. S. Miller, 1995; Miller & Moore, 2006; Moore, 2003; Portes, 2005; Roeder, 1999, 2000, 2001; Rothstein, 2004; Wilson, 1987). The raw *B* coefficient in this regression exhibits the continuing powerful effect that socioeconomic disadvantage brings to bear on school success and accountability. A one unit increase in this variable produces a whopping decrease of 15.6 units in the Academic Index. This significant factor continues to plague the standards and accountability movement and remains a concern for Kentucky principals with respect to the fairness of accountability in schools where high numbers of students are at risk.

Although Kentucky provides additional support for disadvantaged schools, the state makes no allowance in calculating the Accountability Index. The state brooks no excuses in the accountability arena, a far-reaching assumption that disadvantaged schools have reached a level playing field. This research counters such an assumption. The adequacy of Kentucky's support for such disadvantaged schools remains in question. Current processes seem to have allowed, if not nearly insured, that disadvantaged schools will show up disproportionately in the struggling-school population. Giving support after the fact (of failure to meet goals) could easily be viewed as "stepping up to the plate a bit late."

Percent Gifted is another important factor in the study but may well be disguised by the number of participants and the diverse means by which Kentucky schools identify and serve this population. Obviously, an increase in the number of truly gifted students would be a clear advantage in academic performance. Beta values for step 3 of the model

demonstrate an increase of .18 of a standard deviation on the Academic Index as a result of a one standard deviation increase in the percent of gifted students. A more troubling consideration in the fairness of accountability is that disadvantaged schools are likely to have lower percentages of students identified as gifted, a finding strongly confirmed in Moore's (2003) analyses.

The County School variable (as compared to Independent schools) produces positive results in this study. The standardized Beta reveals an Academic Index increase of approximately .08 of a standard deviation on the Academic Index for County Schools over Independent Schools. This finding is congruent with predominantly rural and urban student research by Smith (2005).

Year of Audit is one of the strongest factors in improving accountability scores (beta of .13), an indication of Kentucky's continued progress toward goals. On the whole, schools in the study are improving annually, a testament to the KERA reforms. Yet there continues a concern for the rate of progress, particularly among Kentucky schools that appear unlikely to reach proficiency by 2014. Roeder's (2001) work questions whether all schools are on track to reach the 2014 goal of proficient. Kentucky provides an extensive support system for schools in the lowest one-third of those below their assistance line (Level 3 Assistance School) but even this may not be enough in all cases. Support for those in the most desperate accountability straits will have to be ratcheted up if the state is realistic in getting all schools to proficiency by 2014. Unfortunately, the program is costly and at the yearly whim of legislative funding. Thus continued financing of the Scholastic Audits and support teams related to that process represent a test of the state's commitment to ensuring that all schools will succeed as opposed to hollow rhetoric that says "all children can learn" but does not provide educators with the tools needed to achieve that

goal.

Two significant independent variables are central to this study: Leadership and Instruction. These variables account for an additional 7% and 4%, respectively, of the variance on the Academic Index after the demographic factors are entered. While the effects are not large in comparison with a variable like Free and Reduced Lunch or Percent Gifted, they are ripe for and open to improvement. Certainly, these variables lie within the local school's sphere of influence (Bloom, 1980). Further, these variables are of high value to public and legislative perceptions where public education is concerned. Finally, it is noteworthy that Leadership enters in Step 2 and Instruction in Step 3 of the hierarchical regression, thus providing strong empirical support for a mediated effects model of instructional Leadership (cf. Hallinger & Heck, 1998; Murphy 2004).

Supplemental Research Question 1

To what extent are results of factor analysis of the sets of indicators for Standards 1, 3, and 7 consistent with the Leverage Points, Variance Points, and Common Points identified by KDE?

Each of the nine standards in Kentucky's school improvement model has a set of indicators that represent behaviors or attitudes associated with the respective standards. Kentucky's extensive background in reform and the development of standards guided this powerful model for school improvement, but the researcher has found no indication that a formal psychometric assessment of the sets of indicators was conducted to determine if they constitute a unitary factor or contain subfactors. Since these indicators represent the survey questions upon which the data for this study are derived, it becomes important to examine the psychometric properties for each of the three standards investigated. Analysis of indicators for all nine standards is beyond the scope of this study.

Analysis

The study reveals that the 11 indicators of Leadership form a single factor, accounting for 54.6% of the variance among the items. Cronbach's coefficient alpha was computed on this factor to determine the internal reliability of the scale, producing a composite value of .915. The mean ($M = 2.90$) and the standard deviation ($SD = 1.37$) for the composite scale likewise indicate good psychometric properties. This makes a strong case for the indicators as they give meaning to the Leadership standard and lends statistical credibility to Kentucky's process of developing these indicators from the research base.

The seven Curriculum indicators also form a single factor, explaining 56.9% of the internal variance. Cronbach's alpha confirms the internal reliability of the scale with a composite score of .872. Both individual items and the composite scale indicate good psychometric properties. The mean ($M = 2.25$) and standard deviation ($SD = 1.26$) for the composite scale add strength to the statistical properties for Curriculum indicators. Again, the design for the Curriculum standard and accompanying indicators proves psychometrically sound.

The Instruction standard is comprised of eight indicators. Again, the analysis produced a single factor, in this case explaining 51.0% of the variance internally among the items. The composite Cronbach's alpha of .857 confirms that all three sets of indicators have high internal reliability, being well above accepted values. Finally the mean and standard deviations for both the individual Instruction items and the composite scale ($M = 2.13$, $SD = 1.08$) reflect adequate properties.

In contrast to the analyses reported here, the KDE has conducted essentially no investigation of the Standards and Indicators for School Improvement, Kentucky's whole-school improvement model. The KDE did examine the extent that selected indicators

(Leverage Points) distinguished between high and low performing schools on the Accountability Index (Division of School Improvement, 2003). But this was an informal assessment, involved only the 2000-2001 round of audits, covered all nine standards, and was based on all levels of schools--elementary, middle, and high. Four of the 16 leverage points identified come from the three standards involved in this study (1, 3, and 7): Curriculum, 1.1d; Instruction, 3.1b; and Leadership, 7.1c and 7.1d (see Appendix C).

After the 2002-2003 round of audits/reviews, the term *Leverage Point* was changed to *Variance Point*. Twenty-seven indicators were singled out as variance points using methods similar to those for establishing the previous leverage points. Only four of these variance point indicators came from the standards addressed in this study. From the Curriculum Standard, one indicator is listed (1.1g). Two of the Instruction indicators (3.1b, 3.1d) also made the cut. Finally, one of the Leadership indicators (7.1k) was named. Interestingly, but outside the purpose of this study, 10 indicators from Standard 4 (School Culture) appear--as may be noted in reviewing the complete list of Variance Points (Appendix D).

From the Leverage Points and Variance points Kentucky further refined a list of six Common Variance Points (Appendix E). The refined list allowed schools to focus on a more discrete number of objectives in addressing improvement. Again, these were established as points where low performing schools differ greatly from high performing schools. Common to this study, only one indicator appeared--that from Standard 3, Instruction, 3.1b.

In 2005, Kentucky decided to delineate a list of important points derived from the sum of audit data since the inception in 2000-2001. As a result, 11 Common Variance Points were released (Appendix F). This was a timely announcement because it allows a

more congruent analysis of the state's findings with the results of this research, at least in the sense that both works span the same time frame. As clarified previously, there still remains considerable variance in methodologies between the state's work and this study, which may explain any differing results. Of the three focal standards of this study (Curriculum, Instruction, Leadership), only Leadership contributed significant indicators in common with the state's 11 points. Furthermore, Leadership accounted for five of the 11 points (7.1c, 7.1e, 7.1g, 7.1h, 7.1k).

In a study prepared for KDE (Koger & Thacker, 2004), an effort was made to examine more closely the audit/review data to determine if any information could be gleaned to clarify what separates "successful schools" from other schools. The study used audit data (on file in an electronic media) through June of 2003. Their analysis examined each of the 88 indicators across the nine standards by looking at differences among and between the following three elementary school groups: lowest fifth/Level 3 schools (schools declining the most on a measure of value-added gain or loss); lowest fifth/Successful schools (a measure of low performance on the accountability score), and highest fifth/Successful schools (a measure of high performance on the accountability score).

When the three groups were compared, 87 of the 88 indicators were significantly different on at least one comparison. For the lowest fifth/Successful schools versus the highest fifth/Successful schools, 50 of the 88 indicators were significantly different. Analyzing the lowest fifth/Level 3 schools against the highest fifth/Successful schools revealed that 87 of 88 indicators were significantly different. A final comparison of lowest fifth/Level 3 schools with the lowest fifth/Successful schools found 59 of 88 indicators significantly different. Koger and Thacker (2004, p. iv) summarized the following: All

schools can improve; there are distinct, measurable differences among each of the three school groups; there are areas where Successful schools, regardless of their academic indices, have similarities; there are areas where schools with lower academic indices have similarities regardless of their progress toward meeting goals.

Thus, the psychometric analyses conducted in this study are not consistent with the limited studies that the KDE has performed on these standards and their indicators. But that result should not be unexpected. First, the time frame for these analyses differed. Only for the last set of 11 Common Variance Points did the state's data match the years covered in this study. Second, the state examined all grade levels while this study looked only at elementary schools. Finally, and perhaps most important, the criteria were different. The factor analysis and Cronbach's alpha examine properties internal to the set of indicators for a given standard, whereas the KDE was looking for evidence of specific indicators (individually, not as the set for a standard) that related to an external criterion, the Accountability Index. The different results reflect different criteria and procedures.

Supplemental Research Question 2

To what extent are results of multiple regressions based on Figure 1 for this study consistent with results of regression analyses based on the Leverage Points, Variance Points, and Common Points identified by KDE?

In SRQ1, the results of this investigation were not really comparable to the analyses conducted by the Kentucky Department of Education. In contrast, SRQ2 addresses outcomes that are much more similar. This study takes a more formal approach to identifying indicators that are statistically significant in affecting school scores (Academic Index) than did KDE's informal means of inspecting for indicators that distinguished between high and low performing schools across the nine standards. Since this study only examines three of Kentucky's standards, only those indicators are

considered. As was the case for SRQ1, the time frame for KDE's Leverage Points, Variance Points, and the first set of six Common Variance Points (Appendices C-E, respectively) do not match the analyses from this study. Because Kentucky's 11 Common Variance Points were derived from the entire range of audits, this study's results may more closely match that second set (listed in Appendix F).

Consistency of this study with Kentucky's Leverage Points, Variance Points, and Common Variance Points is limited by the differences in purpose and methods. Kentucky identified these as points in which schools in decline differ greatly from successful schools. Kentucky's purpose is to help schools focus their improvement efforts; the assumption is that if struggling schools were to improve their performance on the Common Variance Points to the level of the successful schools, this would bring about progress in achievement. Kentucky's nine standards considered in their totality are believed to lead to whole-school improvement (KDE, 2004d). However, this study addresses school improvement only from the perspective of efforts to improve key variance indicators within the Curriculum, Instruction, and Leadership Standards.

As of this time, little work beyond this study examines Kentucky's whole-school improvement model. Koger and Thacker (2004) identified several characteristics that distinguish successful schools from struggling schools, performing a detailed analysis of scores on all 88 indicators for audits conducted through June of 2003. Their study confirms that there are areas where successful schools, regardless of their academic indices, have similarities and that there are areas where schools with lower academic indices have similarities regardless of their progress toward meeting their goal.

Analysis

In Supplemental Research Question 2, the focus is the identification of indicators

that influence accountability outcomes on a specific level of schooling, in this case elementary schools. The KDE identified indicators on which high performing schools scored high while the schools not meeting their growth goals scored low (see Appendix F, the 11 Common Variance Points). In contrast, this study regressed the Academic Index on the three sets of indicators for Standards 1, 3, and 7 across all schools in the study ($N = 181$). The results (Tables H1-H3 in Appendix H) identify those indicators having a significant effect on a school's achievement. These indicators (see below) can be contrasted with the state's 11 Common Variance Points. Both lists are focused on understanding the internal dynamics of how to improve a school's accountability scores. Yet the combination of different data sets (all levels of schools audited for KDE versus the 181 elementary schools containing Academic Index accountability data from grades 4 and 5 only for this study) and differing approach may be expected to produce discrepant findings.

Regression for the seven Curriculum Standard indicators (Table H1) revealed that three produced a significant effect on the Academic Index. These are listed as follows:

- 1.1d. There is evidence of vertical communication with an intentional focus on key curriculum transition points within grade configurations (e.g., from primary to middle and middle to high).
- 1.1e. The school curriculum provides specific links to continuing education, life and career options.
- 1.1g. The curriculum provides access to a common academic core for all students.

Indicator 1.1d appears in Kentucky's initial list of 17 Leverage Points. Indicator 1.1g appears on the list of 27 Common Variance Points (gleaned from the second round of audits). None of the Curriculum Indicators are identified in either of Kentucky's lists of six and 11 Common Variance Points.

Thus the evidence for Curriculum is quite mixed with respect to its effects on accountability. For KDE's analyses 1 indicator (but not the same one) was part of the first two rounds of Leverage Points and Variance Points, respectively. For the regression of the Curriculum and Instruction Standards for their effect on the Academic Index, Instruction was significant but Curriculum was not (although nearly so, at $p = .053$). For the regression of the 7 Curriculum Indicators (Table H1), three (just listed) were significant. Finally, in the hierarchical regression for RQ4 (with demographic factors entered first), Curriculum was not even close to significant. Thus Curriculum and its indicators seem to be marginally influential, dependent upon the particular sample and criteria and methods utilized. This seems to concur with the broader literature (Madaus & Clarke, 2001), that curriculum is more important with respect to fundamental decisions about what is taught or not taught. Curriculum's effect on outcomes seems to be more a consideration of the degree of alignment between the curriculum and the particular achievement test. Since the Academic Index is constructed from KCCT, which are based upon and closely aligned with Kentucky's Core Content, this factor does not show up on accountability outcomes.

Regression of the Instruction Indicators (Table H2) leads to four being significant, listed as follows:

- 3.1b. Instructional strategies and learning activities are aligned with the district, school, and state learning goals and assessment expectations for student learning.
- 3.1d. Teachers demonstrate the content knowledge necessary to challenge and motivate students to high levels of learning.
- 3.1e. There is evidence that teachers incorporate the use of technology in their classrooms.
- 3.1f. Instructional resources (textbooks, supplemental reading, technology) are sufficient to effectively deliver the curriculum.

The Instruction Indicators identified in this analysis appear to have most in common with Kentucky's established variance points. Instruction Indicator 3.1b also appears on Kentucky's list of Leverage Points, Variance Points, and Six Common Variance Points. Indicators 3.1b and 3.1d appear on the list of Variance Points. Indicator 3.1e is the only item that is common to both this study and Kentucky's final list of 11 Common Variance Points. With the power of instruction to effect student achievement (Darling-Hammond, 2004), it is surprising that only one of the Instruction Indicators made Kentucky's final 11 Common Variance Points list. Yet clearly instruction is more directly linked to achievement than curriculum. In addition to the issue of curriculum-instruction-test alignment, there is also the *quality* of how teachers present information. Both Kentucky's informal examination of indicators that distinguish higher and lower schools and the more formal statistical procedures in this study support that conclusion.

A puzzling finding is that Indicator 3.1g is nearly significant in Table H2 ($p = .066$) but has a negative effect (3.1g: Teachers examine and discuss student work collaboratively and use this information to inform their practice). One possible explanation of this is that such discussions may become fodder for negative lounge talk and the "low achievers" get "reputations" that follow them throughout the school. This would be consistent with earlier school learning climate research (Brookover et al., 1979).

Of the 11 Leadership indicators, regression analysis in this study Table H3 (Appendix H) identified only one as significant.

7.1j. There is evidence that the SBDM (Site Based Decision Making) council has an intentional focus on student academic performance.

The above Leadership Indicator does not appear on any of the Kentucky lists compared previously. However, the 17 Leverage Points include two other Leadership Indicators

(7.1c and 7.1d--Appendix C), while the 27 Variance points included only Leadership Indicator 7.1h. It is interesting to note that Kentucky's final list of 11 Common Points includes five Leadership Indicators (see Appendix F--7.1c, 7.1e, 7.1g, 7.1h, and 7.1k) with two of these appearing in the previous Leverage Points and Variance Points. It is noteworthy that Indicator 7.1j reflects very closely the prime directive for Kentucky's SBDM councils--improve student achievement.

With respect to the focal interest of Leadership in this study, a regression analysis (Table 16) was performed on the five Leadership Indicators identified in Kentucky's list of 11 Common Indicators with the Academic Index as the dependent variable. The model proved significant, with an adjusted R^2 of .21. However, only Indicator 7.1g (Leadership plans and allocates resources, monitors progress, provides organizational infrastructure, and removes barriers in order to sustain continuous school improvement) was significant in the model with $p = .029$. This is similar to Table H3 for Leadership Indicator 7.1j (adjusted $R^2 = .24$). What seems to be the case for Leadership is its clear-cut importance in all of these different analyses--KDE's Leverage Points, Variance Points, and 11 Common Variance Points and this study's investigations of both Leadership Standard 7 itself and its separate indicators. But the particular indicators that are significant tend to vary (both sample and methods specific). Still, the consistent findings confirm the importance of leadership in school improvement: Kentucky's comprehensive reform initiatives and high-stakes, value-added accountability depend on principals and other informal leaders if these challenging goals are to be met.

Relevant to this study and due to the nature of the different sets of "variance points," it may be noted that the school principal, as an instructional leader, would be closely involved in any school response to the identified points. This literature review has

revealed essentially no research, outside the KDE, focusing on Kentucky's Standards and Indicators for School Improvement or Kentucky's Scholastic Audit. The primary exception, Allen (2004), reports the usefulness of Kentucky's audits in general but does not venture into a detailed study of Kentucky's audit concepts or audit results.

Implications for Policy

Curricular, Instructional, and Leadership effects noted in this study offer hope for school improvement. Standards and accountability alone have been inadequate in achieving goals for all schools and all students. Kentucky wisely incorporated the concept of instructional leadership in its reform model but little provision was made for the cultural indoctrination needed to embed the concept in practice. Current developmental models for principals (and other instructional leaders) have been moving too slowly and/or are inadequate for achieving a high degree of instructional leadership in all schools. Development of policy, as is often the case, is easier and quicker than developing the skill sets of true "Instructional Leadership." It is evident that policy needs amending to provide a long-term framework for developing the capabilities necessary to implement instructional leadership practices. Extensive training/professional development will be necessary to root out deeply embedded but ineffective models of instruction and leadership.

Converting the traditional principalship role to that of effective instructional leadership has proven to be a difficult challenge. Policy enabling this complex transition seems to lack clarity and strength in effecting the deep cultural shift necessary to institutionalize this new paradigm. The whole process has been taken for granted or at least taken too lightly. For example, many schools have adopted a "walk-through" practice as a tool of instructional leadership. Principals often receive some training in the

practice but the depth of knowledge about instruction and the cultural foundation for implementation of this practice is far too often not in place.

The more refined industrial “walk-through” offers a model for effective use in the schools. According to Liker (2004, p. 147) “Toyota spends years working with its people to instill in them the importance of using and improving standards.” This demands “years of practice in the field” (comparable to years of instructional practice) and “in-depth understanding of the work” (comparable to extensive content, curricular, and instructional understanding), in addition to general management expertise. The model defies the notion that school leaders can be brought in from fields outside education. The years of practice at the classroom level is significantly absent when leadership is imported from other fields. Toyota promotes leadership from within its ranks, choosing to groom and select carefully from those who live and thoroughly understand the culture (Liker, p. 173). Educational policy has leaned toward rules and metrics rather than building a learning organization based on solid cultural foundations. However, Kentucky seems to be changing this with its whole-school reform model, the Standards and Indicators for School Improvement. Noteworthy is the fact that School Culture (Standard 4) and its importance are supported both in the school improvement literature (Shutt, 2004; Wagner, 1998) and the predominance of the School Culture Indicators in the Kentucky Department of Education’s various lists of “variance points” that distinguish between schools in decline and high performing schools.

Furthermore, with the exception of test-taking skills, educators can’t “teach” achievement. Rather, there is a set curriculum that is presented to students through instructional practices; both the what and the how of learning can be enhanced by certain leadership practices. Thus to have an impact on achievement, the structures, processes,

and dynamics (read what educators *do*) with respect to what is taught, how, and with what facilitative support must be addressed and changed to become more effective and more efficient than whatever extant practices are in place.

This is where Kentucky's Standards and Indicators for School Improvement enter the picture. These standards and their respective indicators represent a first and unique attempt to extend the curriculum based standards to whole school improvement, in effect giving behavioral specificity to these nine complementary pieces of the school fabric. But this may not be sufficient. Although the three standards investigated in this study (Curriculum, Instruction, and Leadership) are correlated with student achievement and their sum effect on achievement is significant, certain parameters of each standard defy measurement or quantification by achievement scores alone. For example, achievement scores do not identify specifically the principal's instructional leadership ability. Even in successful schools, the source of instructional leadership may be hidden in the myriad factors forming a school's culture. Achievement scores alone may serve their purpose as designed, but policy makers must use caution in assuming they adequately measure all important aspects of schools. Likewise, the indicators in these standards represent important dispositions and practices but do not necessarily address all of the subtle and unwritten codes that contribute to the overall learning climate in a school.

The importance of leadership in general (Standard 7) and instructional leadership as embedded in Kentucky's reform (KDE, 2006b) is established in this study. Findings suggest that Scholastic Audit measures of Kentucky principals are significant to student achievement. Given the high proportion of low performing schools in this sample, this seems to be particularly true for schools that need to improve. Clearly, additional study would be useful in validating this assumption for all schools, and generalizability remains

limited in light of the fact that this study is confined to audited elementary schools (albeit some of the volunteer schools were high performing).

Kentucky's accountability formula has been adjusted over the course of reform and continues to change in light of educational developments. The recent removal of the norm-referenced CTBS from the accountability calculation is a step toward greater alignment of the academic expectations with standards established by the state. Kentucky will soon incorporate the ACT tests in the accountability formula (Lindsey, 2007). Changes like this spawn from policy and such changes will continue to be necessary as the state responds to developing societal needs.

Kentucky's Scholastic Audit process promises to inform achievement progress. Presently the process is dedicated primarily to struggling schools. A broadened range of audited schools would be useful to increase understanding of accountability over the entire scale of improvement--from baseline to proficiency. This benefit would require expansion of the audit program to gather data from schools across the spectrum of improvement, a statement that carries the implication of *greater resources* for the time, training, and analysis inherent in more audit teams.

A national Scholastic Audit would provide a clearer picture of what is going on in schools with respect to whole school reform. In this sense, schools are evaluated with inside, on-site data for improvement, rather than relying on the larger field of generalized research findings to drive on-site decisions that need to be specifically tailored to each school's needs. Alabama is following Kentucky's SISI model for auditing schools and a number of other states are interested, but the practice of auditing for whole school improvement has not been embraced on a national scale. Whole school improvement encompasses much more than achievement scores, is a continuing and long term

construct, addresses deep cultural questions, and in effect approaches problems at their root source.

The Scholastic Audit represents the most comprehensive attempt to date to formalize a model of whole school reform. The potential of this model is both exceptional and unrealized. This research represents the first formal analysis of the Scholastic Audit data. More study will certainly follow. It is almost axiomatic that further work will be required in both the procedures utilized in examining the data and in the Scholastic Audit itself. (Ground breaking efforts in any endeavor inevitably undergo revisions and improvements.) These changes will likely address both the standards and indicators themselves as well as the procedures for training and selecting the audit teams and the on-site audits. (One comment during the dissertation defense was that the audit visitations were becoming “bureaucratized”--too much like external accreditations.) This leads to the inevitable question of balancing a formal state policy with sufficient “teeth” to inspire change without becoming mired in the inefficiencies of bureaucratic regulations, institutionalized rules, and emphasis on “looking good on paper” (cf. Meyer & Rowan, 1977, 1978; Reeves, 2006).

Yet such concerns need not become the legacy of the Scholastic Audit. This study capitalizes on Scholastic Audit data, which provides valuable insight to standards, accountability, and school improvement. Scholastic Audit teams share a concept found in some Japanese business models of “genchi genbutsu” or “go look, go see” (Liker, 2004). The concept is a powerful tool for observing and evaluating practice and can result in immediate improvement with guidance from the observer. With continued improvements in the audit process and expansion to schools across the entire performance spectrum, the Scholastic Audit has unprecedented potential for creating a clearer picture of reform--from

schools in greatest need of improvement to those achieving accountability goals.

Policy is needed to address waste in education. Typically, this concept has been applied to such matters as saving cost in utilities and operating as a sort of lean production facility. With respect to this study, waste takes on the meaning of more efficiency in the learning model. That is to say where instructional leadership is weak, instruction is likely to suffer. Instruction should add continuous value to students. With respect to leadership, ineffective principals generate waste, in the form of energy expended and actions taken that are not directly connected to student achievement and whole school improvement. The problem is not lack of effort (Reeves, 2006). Principals work hard, even ineffective ones. Rather, their actions and priorities are misplaced. When their practices do not add value as desired or result in a less than desirable improvement, they may be considered a waste. When good teachers are not apprised of best practices, a waste occurs in the classroom. If standards are properly established and content is not aligned at the classroom level, more waste occurs. Everything that does not add value to student learning (which should be parallel with standards and accountability models) deserves scrutiny for it may well be waste. Thus, the question becomes, how best to give Kentucky principals the tools that will replace inefficient or ineffective strategies with those that work, with practices that will propel their schools toward the challenging goal of Proficiency by the year 2014?

Analysis of the standard indicators over five cycles of audits reveals some discrepancy between this study's findings and the state's view of variance points as they are used to guide improvement planning. A couple of policy considerations are in order on this matter. First, this study clearly distinguishes the fact that indicators for the three standards focal to the study hang together exceptionally well. That is, all of the indicators

are important to the standard; any singling out of certain indicators risks overlooking the value of the entire set of indicators. Kentucky is adamant that all nine standards work together for whole school improvement (Division of School Improvement, 2003). This study is equally adamant that all indicators for the three standards studied are considered in any evaluation, or planning, or decision related to school improvement. Second, this study considers these standards and indicators with respect to school achievement scores (Academic Index), which may be useful for achievement goals. However, the state's utilization of the overall Accountability Index may be more significant for whole school improvement because it includes the non-cognitive index as well. Although the contributions of this non-cognitive data to the Accountability Index is limited at the elementary level (3.75% for schools with NRT grades or 5% for schools without NRT grades), it does serve as a reminder, too often forgotten in this "accountability era," that schools are (or should be) more than just a narrow focus on achievement outcomes (cf. Reeves, 2006; Rothstein, 2004).

Kentucky's Scholastic Audit plays a role in support decisions and allocation of improvement resources to struggling schools. The degree of support and effectiveness is ground breaking in the sense that problems are engaged at the source, generally the local school or classroom level, but the more difficult reality of the whole arena of "disadvantaged" must be considered. The more powerful, long-term considerations of finding and addressing root causes rather than the more traditional short-term fix is a significant policy shift.

A significant role of accountability (just beginning to unfold in earnest in Kentucky) is that it tends to uncover deep issues that could remain hidden in the more traditional bureaucratic culture. For example, Kentucky's venture into the highest level of

support for the most struggling schools has highlighted problems associated with concentrations of disadvantages (cf. Wilson, 1987). Solutions being offered demonstrate the cost of repair for approaches at the school level when broader problems are not being addressed at the root level. Put another way, the effects of poverty begin at the pre-natal stage and continue from birth. By the time children begin school, the ravages of at-risk environments can be seen in both individual children and schools where large numbers of these students attend (cf. Rothstein, 2004). Serious attention to the needs of these children will require significant changes in both public attitudes and current policymakers. Such a response would be a far cry from popular accountability clichés such as “all children can learn at higher levels.”

It cannot be over emphasized that in this study, despite the contributions of Leadership and Instruction to the Academic Index, and the overall confirmation of both the Scholastic Audit and the mediated effects of leadership, the *overwhelming* influence on achievement (60%) was the demographic factors. This represents an *unequal* playing field that cannot be ignored and confirms the findings of a number of other major studies of Kentucky’s accountability (cf. Guskey, 1997; Lyons, 2004; Moore, 2003; Roeder 1999, 2000, 2001). The current study, coupled with this other work, exposes powerful contradictions in the current accountability model. Policy changes based on this reality of demographics are sorely needed in Kentucky’s improvement venture.

If Kentucky is to fine-tune its response to “struggling schools,” policies will be needed that channel resources to effective support measures. Accountability implies a promise to all schools and student sub-populations. Yet it seems evident that disadvantaged schools will need more resources and other policy supports if they are to achieve their goals. In earlier stages accountability models seemed to gloss over the well-

known reality that certain demographic factors strongly affect achievement. As more and more research uncovers the deficiencies in these formulas, policy adjustments are in order. Unfortunately, the first consideration of politics is often cost, not realistic appraisal of goal attainment. The question looms: are Kentucky's policymakers and the public ready to commit the resources that are necessary to ensure that *all* children and schools reach the challenging twin goals of KERA--*excellence* and *equity*?

Future Research

This study has opened the door for further research not only because of its significant findings but also through highlighting a unique data set. Examining relationships among demographic variables, curriculum, instruction, leadership, and academic scores with data compiled from observations within large numbers of schools is an unprecedented breakthrough: the nation's first extensive Scholastic Audit process designed around standards, accountability, and whole school improvement. This study examines only a portion of the available data, a limited view confined by practicality and reasonable research goals. Accordingly, the opportunities for further research that spring from this work are numerous, from other combinations of standards to the overall SISI data set.

Researchers have on-going opportunities to study Kentucky's evolving reform and to help schools apply those lessons. An area closely related to this subject is the state's effort to bring about effective instructional leadership. A critical problem is that existing knowledge of effective instruction has yet to permeate practice at the school level. Current organizational frameworks have not proved adequate to enable principals to grasp and implement concepts of instructional leadership. School leaders, in many cases, do not understand best practices to the depth necessary to provide guidance in this critical aspect

of schooling.

Kentucky's accountability movement is unique in several respects, but clearly is not out of touch with the national movement toward standards and assessment. Two issues of significance evolve from this study's results. Of primary significance is the role of the principal in academic success, specifically the emphasis on instructional leadership ability. Second, the state's Scholastic audit process reveals a powerful mechanism for supporting struggling schools. Mintrop (2003), Mintrop and Trujillo (2005), and Stringfield and Yakimowski-Srebnick (2005) have all stressed the importance of an adequate model of support for helping the most distressed schools, which typically are overwhelmed by concentrations of at-risk students, inexperienced or inadequately prepared staff, and a woeful lack of resources. Needed are additional personnel, extensive professional development, infusions of leadership, and new resources.

What is unique about Kentucky's Scholastic audit process is that the Standards and Indicators for School Improvement constitute a research-based framework for consolidating all of these factors--starting with the detailed audit of a school's needs to the provision of Highly Skilled Educators to guide and assist in implementation of school improvement based on specific diagnoses targeted to the nine standards. Thus, as severe as accountability's teeth may be, Kentucky is obviously aware of the urgency to help schools improve, rather than simply implement negative consequences. Schools have been given every opportunity to improve on their own and/or with state support. In fact, the state has yet to exercise its option of taking over a school in decline.

To the contrary, low performance has resulted in an earnest effort by the state to identify school needs and offer professional support in addressing identified deficiencies. The Scholastic Audit is a thorough, individualized investigation into the innermost

sanctuaries of the local school. With this research-based data in hand, Highly Skilled Educators (HSE) work with schools to bring about improvement. KDE (2007) touts the track record of this support process as being very impressive. Kentucky currently employs 45 HSEs, all assigned to local schools to support improvement. This current study springs from the scholastic audit process but does not extend to the effect of these Highly Skilled Educators, an arena ripe for extensive investigation.

While there has been an ongoing attempt to help low achieving schools as part of the tenets of KERA, the state has just begun to deal with chronically low-performing schools, administering more intense improvement processes. These schools offer formidable challenges, as previous improvement efforts have not brought about acceptable results. Kentucky has put its entire accountability model (and the assumption that all children and all schools can perform at high levels) on the line through its intervention model, based as it is, on the whole-school Standards and Indicators for School Improvement. Educators and researchers will be interested observers as this plays out. The accountability measures in place will make success or failure easily observable by those standards. The media will certainly be quick to report results.

These public circumstances almost certainly will influence the educators who work on these difficult school settings where demographic factors represent a significant barrier to high achievement. That accountability alone is insufficient for success in all schools is increasingly evident in the research on KERA reforms--some schools not on-track to reach Proficiency; the existence of schools not making adequate progress; the overwhelming influence of demography on accountability outcomes (Guskey, 1997; Lyons, 2004; Moore, 2003; Roeder, 1999, 2000, 2001; this study). For researchers, the next stop may be observing developments in these more sophisticated and concentrated

efforts to support all schools.

Teams who work closely with at-risk schools, and in particular the Highly Skilled Educators assigned to them, glean a privileged, researched, data driven, standards-based insight into school problems. The value of this knowledge is yet to be fully realized. The author of this study is convinced that quantifying the findings/insights of these Highly Skilled Educators--on-site, in the classroom, elbow-to-elbow with principals--is a research opportunity offering a quantum leap in improving schools and closing achievement gaps. Kentucky's venture in turning around the most difficult school performance settings is another opportunity for public education to redeem itself as capable of serving all schools in the achievement of accountability standards.

Scholastic Audit teams compile a comprehensive picture of a school's effort (or lack thereof) to meet accountability goals. As a result, key members of Kentucky's audit teams (Highly-Skilled Educators) are assigned to struggling schools for extended periods of time to support improvement. These Highly Skilled educators hold a wealth of researchable insight related to making accountability work for all schools. They have, perhaps, the clearest view of what is going on in struggling schools because they offer the greatest challenge to the standards and accountability movement. At any rate, Highly Skilled Educators and their interventions constitute a rich mine for researchers.

This study focused on three of Kentucky's nine Standards--Curriculum, Instruction, and Leadership. It is clear that the state intends that all nine of the Standards and Indicators for School Improvement are to be considered in whole-school improvement decisions. Obviously research could be expanded to consider other combinations of these standards, as well as all nine standards, inclusive of some 88 indicators. Indeed, two other studies are currently underway (Ennis, 2007, on professional development and leadership)

and (Saravia, 2007, on school climate and parent involvement), and more studies are being considered in order to expand the understanding of Kentucky's accountability model. Psychometric analysis in this study confirms the reliability of the Indicators for three of the state's standards; such confirmation for all standards would be useful. Given the effect sizes in this study for the influence of the three standards on the Academic Index, it is imperative to understand the comparable effects of other sets of standards, or indeed from all nine.

This study also limits perspective to Kentucky's elementary schools. The Scholastic Audit database is largely compiled of elementary schools, but data also exist for middle and high schools, albeit in a more limited quantity. These school levels are open for investigation as to how accountability unfolds at different levels of schooling. Another dimension, notably absent in this study in which the sample is heavily weighted by schools in decline, is examination of how schools respond to accountability as they slide upward on goal lines, with the presumption that schools at differing levels of progress may require differing approach strategies.

Traditional administrative management did not extend to instructional leadership by the principal. And while the terrain has shifted in that regard, reformers have yet to find a way to provide leaders with the instructional expertise that they need. Rather than the deep cultural change needed to instill effective instructional leadership, quick fixes and brief professional development sessions typically have less than the desired effect. Ineffective or inadequate attempts at instructional leadership can serve to demoralize or confuse staff and leaders (planting the expectations without the means to realize them). This is exacerbated by current organizational frameworks, which actually hinder instructional priorities even where leaders are fairly competent in the matter. Given the

demands of traditional management (which did not go away when instructional leadership was added as a new priority), principals who can only spend 30% of their time with instructional leadership may not be doing justice to the concept.

An interesting project, currently under way in Kentucky, is the so-called SAMs (School Administration Manager) project. The project is attracting attention nationwide and is worthy of notice among researchers. It is a significant attempt to provide the actual knowledge and resources needed to implement instructional leadership. The model is costly, providing for a new position at the school level, a School Administration Manager. The position is designed to remove workload from the principal in order to provide time both for training and implementing the practice of instructional leadership. The project seeks to overcome at least two of the major hurdles that have traditionally hampered instructional leaders--time and knowledge. Specifically, knowledge of academic content and pedagogical techniques stand out as immediate needs. In 2006, the experiment involved seven elementary schools in four districts (Noland, 2007). The project is expected to expand to more schools next year. Further information is available from Kentucky's Office of Leadership and School Improvement.

In 2005, Kentucky began to take a serious look at the status of principal preparation programs in the Commonwealth. As a result, the state now offers a district-sponsored pathway to principalship (Commonwealth Institute for School Leadership, 2006). This avenue would be in addition to the existing college/university model and alternative certification routes approved by the Educational Professional Standards Board. The goals are to

1. Provide school leadership that will ensure all students reach proficiency by 2014 and beyond;

2. Develop leadership with and beyond the school;
3. Identify and grow tomorrow's leaders; and
4. Create a pathway for aspiring principals to receive certification through a nontraditional research-based, best practice clinical model. (p. 3)

The institute envisions recruiting, selecting, preparing, supporting, and retaining highly effective principals across the Commonwealth who are equipped with the content knowledge and leadership skills to improve teaching and learning. This effort bears observing as Kentucky attempts to mold its principalship role to conform with expectations inherent in both ISLLC and the Standards and Indicators for School Improvement.

Kentucky's instructional leadership construct is evolving from goals toward reality. With the state's approach toward this expectation still in experimental stages, KDE's audit process is explicit in prioritizing instructional leadership, opening the door for all schools (and all students) to improve. Even the all powerful (and too often hidden) socioeconomic disadvantages of certain demographic populations and schools are being recognized in Kentucky's improvement model. Thus, this research clearly indicates the need for more focused investigation of the effects of leadership on achievement outcomes and instructional practice, particularly in the context of high-stakes accountability.

This study has focused primarily on effects of leadership and accountability in situations where schools are in decline. Much attention has been given by the state to supporting these needy schools. Pointed out in the literature is the fact that successful schools are not challenged by accountability goals to the degree that struggling schools are. Thus it may be timely for researchers to turn some attention to appropriate and equally challenging expectations for successful and advantaged schools. Failing to uphold

the potential of standards-based accountability at this end of the performance spectrum would be disappointing for whole-school reform at all levels. It would also reinforce the conclusions of many analysts that the entire accountability movement has been unfairly directed at disadvantaged, at-risk schools and students (cf. Berliner & Biddle, 1995).

Conclusions

Kentucky's reform efforts have been the target of numerous research projects. Bold reform is bound to attract attention. The judicial mandate and Kentucky's legislated response (KERA) has brought significant improvement and has endured for 17 years. Controversial issues garnered attention early on as the state addressed funding equity, testing processes, new standards for curricular alignment, and ground breaking work on site-based decision-making. Accountability procedures made school performance data readily available to the public and researchers, but all this attention did not avail researchers a ready opportunity to peer into the inner workings of the local school. Similarly, much rhetoric surrounds the principal's duty to provide instructional leadership and the presumed fact that accountability alone would force schools to meet high standards of performance. However, little is known about *how* these goals become reality.

Scientific research probing the context of reform continues to lack the clarity of in-house, local school insight. In its effort to understand the needs of struggling schools, Kentucky developed a powerful reform model, nine Standards and Indicators for School Improvement. As a result, the state began to compile a unique Scholastic Audit database that provides rich insight into how standards and accountability influence classroom learning. What is unique about the SISI is that Kentucky has extended the curriculum-based standards movement to whole-school reform. The nine standards address significant functions in the operation of schools with each standard having its own set of research-

based indicators (KDE, 2004d).

There has been no previous research that attempts to examine these standards or some subset thereof simultaneously for their comparative effect on achievement. Nor have there been any efforts to examine these data with respect to demographic background or theoretical linkages among these nine standards. Although Division of School Improvement (2003) audits contain information on all nine standards, the analysis of all these standards is beyond the scope of this study. Accordingly, this study examines the relationships among Standard 7 (Leadership), Standard 1 (Curriculum), Standard 3 (Instruction), school accountability scores, and demographic background factors at the elementary school level, with emphasis on the influence of leadership on the other factors. The Scholastic Audit database was compiled by trained teams from the KDE who rated the standards by assigning behaviorally defined score values to the indicators for each standard.

Study results indicate that Leadership plays a significant role in guiding Curriculum decisions; the variable explains almost 35% of the variation in Curriculum. This leadership effect is important considering the study's revelation that Curriculum is highly correlated with Instruction. (The study's highest correlation among all variables considered was between Curriculum and Instruction, $r = .693$.) Leadership also plays a significant role in Instruction, explaining about 36% of the variation for this standard. In turn, the Curriculum and Instruction Standards becomes a significant pathway in the principal's mediated effect on academic success. (Curriculum and Instruction together explain almost 36% of the variance in the Academic Index.)

Finally, Leadership produces a significant effect on Academic Index, with an effect size of .26. These results, taken together, support the consensus that principals do

make a difference in accountability scores. This finding is consistent with current theory (Murphy, 2004) that this impact is primarily mediated through others as opposed to a direct effect. The means by which this indirect influence occurs is somewhat defined by this study (through Curriculum and Instruction, primarily the latter). The 11 Leadership Indicators provide general guidance as to how effective principals “do” instructional leadership. However, the day-to-day activities that constitute these indicators remains unclear and beyond the scope of this study. What is clear is that Kentucky’s focus on instructional leadership targets a significant means for whole-school improvement.

The study also provides a statistical analysis of the extent of relationships among demographic factors, Curriculum, Instruction, Leadership, and achievement. While the significant effect of demographic factors on school achievement is well established, this study examines these factors within the added environment of high-stakes accountability and the nation’s first set of standards for whole school improvement. Results of the study indicate that demographic variables play an important role in a school’s Academic Index (effect size of .60), concurring with the extensive research findings in the literature review.

Given that demographic factors may be significant to academic scores, little consideration has focused on their effect on curriculum, instruction and leadership. This study enlightens understanding with regard to extended ramifications of demographic effects. As it turns out, only the Percent Free and Reduced Lunch yields significant effect on Leadership. Beta values indicate a slight decrease in Leadership effect as Percent Free and Reduced lunch populations increase. The reason for this slight effect is not explained in this study but may be related to perceptions of principals serving in disadvantaged schools or the possible fact that struggling schools are often saddled with less effective

principals. Just as leaders can have a positive impact on achievement, they also can have a marginal, or worse, a negative impact on achievement (Owings et al., 2005).

Another possibility is that leadership in disadvantaged schools may require the diversion of resources to the more basic or immediate emotional and physical needs of students in order to build a long term capacity for learning. Results of this decision may be a wise investment, but those looking only at immediate accountability scores may see this as poor leadership. It is certainly possible that principals and teachers in low performing schools may be vulnerable to lower evaluations due solely to the disadvantaged arena in which they serve. Unfair (or perceived unfair) judgments compound the difficulty of attracting and keeping high quality staff in a disadvantaged school.

Current prospects for placing more effective instructional leaders in low performing schools are bleak at best. Such quality principals are limited in number and are almost absent in the application pool for these at-risk schools. Even where good applicants might be available, community values may actually select against leadership capability for the sake of cultural homogeneity (Little & Miller, in press). In the author's experience, SBDM councils even face considerable difficulty in obtaining teacher applicants who have full certification in the direst areas of need within the state. Some schools have full-time substitutes in accountability-year classrooms (positions where student scores will weigh heavily on the accountability index). More often, in successful schools, highly effective teachers are placed in these grades. Infrastructural incentives currently lead the best and brightest teachers and principals to successful schools and rob disadvantaged schools of this key resource (Boyd et al., 2003; Darling-Hammond & Sykes, 2003; Owings et al., 2005). Kentucky is supporting these struggling schools in their efforts to improve, indeed a noble effort compared to what states have traditionally done in this

respect. However, it seems clear that the accountability movement has yet to overcome the need for more powerful instructional leaders and improved quality of staff in these most desperate schools and may even be exacerbating this problem (cf. Mintrop, 2003; Mintrop & Trujillo, 2005; Stringfield & Yakimowski-Sreblick, 2005; Yeh, 2005).

The research reviewed indicates that little has been done to overcome staff quality issues in struggling schools. As Kentucky continues its leadership in school reform, its most recent intervention for chronically low-performing schools even includes a proposal to bring in groups of “master teachers,” increase teacher training, and assign a supervisor over the school principal (Kenning, 2007). The actual ability to assemble groups of master teachers willing to accept the disadvantaged school assignment may be a challenge and will certainly be of interest in the search for more powerful models of improvement.

In Kentucky, compensatory resources for demographically disadvantaged schools have thus far been insufficient to overcome the widespread effects associated with poverty. To position these schools for proficiency by 2014, considerable work remains to be done. The challenge of getting all schools to the very high level of Proficiency (cf. Rothstein, 2004) brings new meaning to the Brookover et al. (1979) notion that schooling has a greater influence on low income and minority students than on more affluent and white students. Teacher practices have the potential for greater effects the longer they are sustained. The same is true, for better or worse, for peer attitudes.

Kentucky’s accountability design requires a greater concentration on this population because the goal line (to proficiency) is steeper than for affluent schools that start at a higher level. The initial thrust of the lawsuit that precipitated KERA was to remove financial inequities, but the Kentucky Supreme Court ruling in 1989 broke new legal ground by focusing on governance and instruction in addition to financial remedies.

The comprehensive reforms embedded with KERA mandated the elimination of inequities among schools. With the coming of federal pressures (NCLB), the pressures for equitable achievement have become even greater.

As Kentucky leaders bear down on poor school performance, positive efforts to help schools improve may be leaning toward more drastic measures for chronically low-performing schools. Recently, scathing audit reports have appeared in state media of two schools plagued by teacher turnover, poor instruction, weak oversight, inconsistent reforms, adversarial student-teacher relationships and disruptive classrooms (Kenning, 2007). SBDM councils in these schools have been stripped of the power to hire principals, set spending priorities, and establish curriculum, handing those matters to the district superintendent. The principals of the schools are to report directly to the superintendent.

When analyzing Demographic effects on Curriculum and Instruction, little effect is noted (8% of variance for Curriculum and 16% for Instruction). At least, these two standards seem to be fairly immune to demographic disadvantages. There is no glaring support here for a popular assumption that disadvantaged schools automatically means poorer Curriculum and Instruction. As just noted, Demographic effects on the Academic Index are significant and large, explaining 60% of the variance. This large effect simply admits the continued disability of reform to overcome this powerful negative influence on school success. Variables producing significant effects were Percent White, Percent Free and Reduced lunch, County versus Independent School District, Percent Gifted, and Year of Audit.

When all the significant variables of the study were combined in a hierarchical regression to determine effects on the Academic Index, the model demonstrated significance, explaining 71% of the variation on the Academic Index, a very strong effect

for elementary schools, even higher than the Brookover et al. (1979) classic study and considerably beyond the .54 range found by Moore (2003). Within the model, Demographic factors (Percent White, Percent Free and Reduce, Percent Gifted, County School, Year of Audit), Leadership, and Instruction are statistically significant at the $p < .05$ level. Admittedly, a significant portion of the strong effect may be attributed to the powerful demographic influence. However, two of the independent variables central to this study, the Leadership and Instruction Standards account for 11% of the variance in the second and third steps of the final regression. While principals may find it difficult to change a school's demographic setting, it is well within the expectations of instructional leadership that teaching practices be addressed effectively. In fact, it is a legal obligation in Kentucky under the Effective Instructional Leadership Act (KDE, 2006b).

The construct of instructional leadership, and how effectively a local principal carries out this task, is a significant factor in school success as framed by Kentucky's accountability model (SISI). The ultimate responsibility for instruction in Kentucky lies with the principal--shared with other school leaders but never delegated away wholesale to assistants, instructional specialists, or teacher leaders. Kentucky principals must have a high level of professional ability to provide this leadership effectively. They must understand instructional practice, recognize good instruction at the classroom level, and apply instructional supervision in helping teachers improve practice. In reality, this study indicates that principals in struggling schools are not currently up to this paramount task. It is beyond the scope of this study to determine why this deficiency occurs, but the study does point out where many principals fall short. That Kentucky schools in decline have a glaring need for stronger instructional leadership is explicit; how to achieve this goal is yet unclear. If all Kentucky schools are to have a chance to reach Proficiency by 2014, the

evidence in this study clearly demonstrates that at-risk schools must have more effective instructional leaders (principals).

There has been almost no research attention given to instructional leadership in Kentucky. The current study is the primary exception. The KDE (Division of School Improvement, 2003) has conducted preliminary analysis of the Scholastic Audit data to see if indicator scores from high achieving schools are distinguishable from the scores of the Level 3 declining schools. That work resulted in several lists of “variance points,” specific indicators from the nine standards that differed between high and low performing schools (see Appendices C-F). Koger and Thacker (2004) did a more formal analysis, utilizing the same approach. However, the KDE and Koger and Thacker studies were focused on the viability of the entire set of nine standards and concomitant Scholastic Audit vis-à-vis whole school improvement. Those analyses did not examine Leadership per se, as did the current study. Other research on leadership utilizing the Scholastic Audit is under way (Ennis, 2007) or in the planning stages, but this small set of studies is clearly instructive as to how much work remains to be done in the realm of instructional leadership. It is notable that this echoes the larger national literature; Waters et al. (2005) state that the educational leadership research of the last two decades, astonishingly, fails all too frequently to examine student achievement as the criterion.

Although instructional leadership is legally part of the state’s reform effort, details of how the practice plays out at the school level have not been quantified beyond this study’s findings that Leadership has a small direct influence on the Academic Index in addition to an indirect effect mediated through instruction. In reality, principals find their jobs overwhelming in many respects. Widespread demands limit their ability to focus on accountability goals and instructional leadership expectations. More attention has been

given to accountability outcomes than to the processes of whole-school improvement.

Unfortunately this view stifles long term planning and favors short term fixes. An obvious result is that most schools have exhausted simple remedies. To be successful in the long term, schools must address how to institutionalize better learning practices. Superficial solutions typically address a specific area of need for one group of students in a particular year. These “fixes” are doomed to require repeating, year after year. While they may be immediately effective, they pile up annually as more band-aids are added, to the point that they may eventually overwhelm a staff. Furthermore such surface-level prescriptions are unlikely to address the deeper cognitive needs of students from disadvantaged backgrounds. Again, the result is short-term improvement that may meet tomorrow’s goals for improvement but not the more challenging goal of Proficiency by 2014.

Principal influence at the classroom level is not only limited by other obligations and/or expectations. Instructional leadership implies a considerable level of expertise about current innovations and effective practice, all of which may vary among student populations and learning levels. Each child developmental level requires an adjustment in learning practices and this development does not necessarily occur in incremental steps parallel with the common practice of identifying student needs by grade level. Such variables complicate and increase the set of skills an instructional leader would need to effect changes at the classroom level and, within that setting, changes needed at the developmental level of individual students.

Training and in-depth exposure to the very best classroom instructional practices is limited in the current organizational framework in which Kentucky principals function. Indeed, organizational realities imply that instructional leadership may need augmentation

by on-site curriculum/instruction specialists who have the expertise and latitude to provide on-going support at the classroom level. Kentucky wisely demands that the responsibility for instructional leadership resides at the highest levels of administration. At the building level, this is the principal. Vesting instructional leadership with the most significant position in the local school (principal) aligns accountability with organizational purpose. Principals can get help but may not delegate the total responsibility for instructional leadership.

Reviewing the literature surrounding the nation's move toward standards and indicators in establishing accountability supports Kentucky's demand for high-quality instructional leadership. In particular the ISLLC Standards (Appendix B) represent an extension of the curriculum-based standards moved to the realm of instructional leadership and the Owings et al. (2005) study confirms the importance of this effort with respect to achievement. Kentucky's SISI document takes the standards movement to the next level: whole school improvement.

This study's findings--the impact of Leadership on the Instruction and Curriculum Standards as well as a small direct effect on Kentucky's Academic Index--supports a continued effort to strengthen principals' abilities and resources in instructional practice. That is, the study verifies that principals do make a difference and that instructional leadership is a significant means by which principals contribute to academic performance.

In addition to analyzing the standards for their effects on accountability, a factor analysis was performed to establish the internal consistency of the standard indicators. Results of those computations confirm Kentucky's effort to design a coherent set of indicators for the three standards investigated. The analysis revealed that each set of standard indicators collapsed to a single factor. When Cronbach's alpha was calculated, an

exceptionally high degree of internal reliability was revealed for all three sets of standard indicators. Curriculum (Standard 1) produced a composite alpha of .874, Instruction (Standard 3) was also high at .857, and Leadership (Standard 7) conformed with an alpha of .915. These results affirm the integrity of Kentucky's Standards and Indicators for School Improvement and the viability of the Scholastic Audit model of whole school improvement (albeit only for these three of the nine standards).

Aside from the study's investigation of the internal consistency of the standards, the work expands Kentucky's effort to identify specific indicators that may hold key value for guiding struggling schools to emulate successful schools. In addition to the multiple regressions to answer Research Questions 1-4, the study investigates the respective indicators for Curriculum, Instruction, and Leadership. Kentucky's identification of key indicators (generally referred to as Variance Points and listed in Appendices C-F) was discussed above, *Supplemental Research Questions 1 and 2*.

In contrast, this study identified three Curriculum Indicators (1.1d, 1.1e, and 1.1g) that had a significant effect on the Academic Index. Likewise, four Instruction Indicators (3.1b, 3.1d, 3.1e, 3.1f) were significant. Finally, five Leadership Indicators were significant.

- 7.1c. There is evidence that all administrators have a growth plan focused on the development of effective leadership skills.
- 7.1e. Leadership ensures all instructional staff has access to curriculum related materials and the training necessary to use curricular and data resources relating to the learning goals for Kentucky public schools.
- 7.1g. Leadership plans and allocates resources, monitors progress, provides organizational infrastructure and removes barriers in order to sustain continuous school improvement.
- 7.1h. The school/district leadership provides the organizational policy and resource infrastructure necessary for the implementation and maintenance of a safe

and effective learning environment.

- 7.1k. There is evidence that the principal demonstrates leadership skills in the areas of academic performance, learning environment, and efficiency.

However, it must be remembered that in addition to the direct effect of these specific indicators on the Academic Index, Research Question 1 demonstrated that Leadership also influences both Curriculum and Instruction. Furthermore, in the regressions for the research questions, a single factor representing all of the 11 indicators was employed, so that all of them need to be considered both their direct and indirect (mediated through Standards 1 and 3) effect on accountability scores.

Summarizing, of the three standards investigated, Instruction has the most powerful direct influence in improving accountability scores. Leadership has both a small direct impact as well as a mediated effect through Instruction. Curriculum was not found to be a direct significant contributor to accountability scores, but principals did affect the curriculum, which was strongly correlated with instruction.

This research has sought to test theoretical assumptions about Demographics, Leadership, Instruction, and Curriculum while examining their influence on accountability scores. The relative importance of each predictor may be judged based on the degree to which predictor variables account for variance in CATS scores (Academic Index is the dependent variable for this study). The larger focus is not on determining the “optimal” set of predictors but to compare Kentucky goals for Leadership, Curriculum, and Instruction with the reality of potential effects on school improvement. Multiple regressions allowed the researcher to account for demographic variables. Though it is impossible to consider every possible control, demographic factors selected for this study are well known for their influence in studies of education. Kentucky’s reform act (KERA) posits a strong

relationship among Leadership, Curriculum, Instruction, and school success. The quantitative results of this study confirm those linkages and support the Scholastic Audit as a model for continued school improvement.

The state has moved beyond short-term responses to initial accountability demands such as curriculum alignment, teaching key vocabulary, and providing motivational incentives for student performance effort. Kentucky continues to address improvement but now is focusing on the more elusive dimensions of school reform such as actual instructional practices, the instillation of quality instructional leadership by principals, changing the school's learning environment and culture of professional development, and addressing structural issues such as planning and resource management. The vehicle for this comprehensive effort is unique in the United States: the set of nine Standards and Indicators for School Improvement (KDE, 2004d) and the Scholastic Audits that informs progress on these dimensions of school reform.

Kentucky schools and principals have embraced their role in improving teaching and learning. Equity demands that the nation close glaring achievement gaps between certain student populations. KERA in 1990, and more recently the No Child Left Behind Act (NCLB, 2001) have formalized this in terms of accountability outcomes. Yet, improving learning opportunities for all students will require more than individual talents or school-by-school efforts. It will demand system wide approaches that touch every child in every school in every district across the state and nation (Stringfield & Datnow, 1998, 2002).

Kentucky's whole-school reform model, the Standards and Indicators for School Improvement, along with its Scholastic Audit, may be a compelling challenge for schools across the nation. A number of states are interested in the approach. Significant features

include a well-designed, comprehensive instrument framed by standards and indicators; a framework for improvement aligned with the SISI document; and an assessment gauged by external, highly trained auditors. The model goes beyond evaluation to active support for struggling schools. This study provides powerful confirmation for the model, at least for the three standards reviewed. The whole-school improvement concept goes beyond the more simplistic and popular discussion of accountability scores. When assessment is viewed as representative of the end goal without adequate supports for school improvement, the test itself can become a barrier to high levels of student achievement (Daggett, 2005).

In its effort to provide research-based support to schools, Kentucky utilizes a highly refined Scholastic Audit. This audit process is closely aligned with the nine standards of school improvement and concomitant indicators developed by the Kentucky Department of Education (2004d). The actual audits are administered by extensively trained teams, which gather a broad range of data from within the school, including observations down to the classroom level. Audit results are then used by the state to identify needs and provide specific support for school improvement. The audit report is respected at the state level, supporting improvement decisions and sharpening the teeth of accountability consequences.

The availability of audit data also avails researchers the unique opportunity to see the inner workings of schools with respect to standards and accountability. Kentucky's Scholastic Audit process is yielding almost unprecedented insight to the internal workings of its local schools. Audit teams document a very thorough investigation of a school's effort to respond to accountability goals within the established framework of standards and indicators. This inside look is a rare opportunity for researchers, providing a rich

source of professionally gathered data specific to standards and accountability.

It should be noted that there exists a wide variety of school culture or school climate surveys which are often dubbed as climate or culture “audits.” The difference between these instruments and Kentucky’s Scholastic Audit is significant. The former are based upon perceptual responses of faculty and or students. Kentucky’s Scholastic Audit is based upon actual school and classroom visits by externally trained teams. Further, the Scholastic Audit has nine standards representing the key structures and processes of the entire school whereas the “climate audits” rarely extend beyond this one component, which is only one of the nine in Kentucky’s model.

The Scholastic Audit is further supported by a powerful intervention plan designed to help schools respond to needs for school improvement. Highly skilled educators are available to these schools in decline in a genuine attempt to identify most urgent needs, focus resources, and guide staff improvement. Though Kentucky’s accountability system, enveloped by federal requirements, does have powerful teeth, no Kentucky school has yet succumbed to the ultimate “State Takeover.” Indeed the state has continued to support even the most struggling schools, giving them the maximum benefit of additional state resources. Participating schools have a significant track record of improvement when Highly Skilled Educators have become involved. In fact, in every case, these struggling schools have been able to move out of the bottom tier of assistance (KDE, 2007a). The punitive perception of forced assistance has eroded as Kentucky’s skilled educators have provided their services to struggling schools that desire to improve. This is in sharp contrast to the dismal effects that have been recorded in several other states where this has been studied (cf. Mintrop, 2003; Mintrop & Trujillo, 2005). Scholastic audits dig into the depths of a school to identify deficiencies that need

improvement. Perhaps even more significant is the state's nationwide leadership in developing a model for turning schools around. This comprehensive battle on behalf of struggling schools is an indication that Kentucky may actually be able to close the loop of accountability and address in earnest the dirtiest secrets of achievement gaps.

The Scholastic Audit practice of "go look, go see" seems to be an effective guide for school leadership. In effective Japanese business models, plant leaders practice this "genchi genbutsu" as a matter of routine. When these managers do a "walk through," they know what to look for and when they observe a problem, their training and experience guides an effective and immediate response. These skilled observers go regularly to the factory floor where production takes place. They look for waste (anything that does not actually add value to the product) and they demand counter-measures to correct any irregularities. They do not send representatives; they go themselves, up to and including the plant manager.

Now, what are the implications for school leaders? Kentucky's instructional leadership act (KDE, 2006b) demands instructional responsibility at all administrative levels. Principals are charged to enter classrooms (look and see), but even as this takes place there is good reason to doubt that all these leaders actually know what to look for; or further, how to effect countermeasures where problems exist. Higher up the administrative chain there may be even more reason to doubt, for example, that superintendents have the skill to practice "genchi genbutsu." The Japanese model includes a support culture for such practices, but the full ramifications may not be fully understood by many education administrators.

Kentucky's reform model for administrators (principals in this study's purview) has yet to establish an equivalent culture of instructional leadership, i.e., the mastery of a

complex set of specific skills, knowledge and dispositions (in the terms used by ISLLC (Council of Chief State School Officers, 1996). The set of 88 indicators that constitute the nine standards of the SISI document represent one way of cataloging this complex set of skills. It is also hopefully the case that new principals may be receiving more effective training in their university preparation. But even if current university training and the SISI indicators were to approximate the necessary knowledge base (and researchers cannot at this point in time confidently attest to that), there is no guarantee that new principals have actually *mastered* these skills. Furthermore, principals long in the field seem to be largely left to their own resources and ambition to obtain effective instructional leadership skills.

The value of Scholastic Audits is enhanced by this study's results. Although the program is designed to guide school improvement, the audit process and resulting data are opening previously hidden passageways to whole-school improvement. Of significant importance, Kentucky's model individualizes the improvement plan for each school, providing a support network tailored for the varying needs of at-risk schools, which almost invariably find themselves falling behind their accountability goals for a broad range of reasons. Initial accountability concepts that claimed high-stakes alone would force schools to improve were certainly over-simplified views as is the case with many solutions that are derived from belief systems rather than empirical evidence. Solving problems at the root cause is a far more complex process where pockets of disadvantaged students overwhelm existing and traditional resources, preventing schools from responding effectively.

High-stakes accountability, standards for improvement, global perspectives, economic, and social considerations are re-defining the educational process. These powerful forces shake foundations and traditions, restructure organizational expectations,

and change the role of all associated individuals. As these tremors reach the local school level, tremendous pressure is applied to respond. Measurement of school performance against standards places any deficiencies in the limelight. At the local level, Kentucky school principals bear the primary burden for school success as clearly defined by the state's accountability system. Based on Kentucky's Standards and Indicators for School Improvement and its accompanying Scholastic Audit procedures, an explicit purpose of this study has been to identify critical factors relevant to principals and their impact on accountability goals through leadership, curriculum decisions, and instructional practice within their buildings. The early returns from these analyses provide hope that educators in Kentucky's most disadvantaged schools may finally have an improvement process that is equal to the challenge.

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APPENDIX A

STANDARDS AND INDICATORS FOR SCHOOL IMPROVEMENT

Appendix A

Standards and Indicators for School Improvement

These Standards and Indicators for School Improvement represent guidelines for schools to maximize potential for all students by delineating professional standards in these areas, organized into three broad categories--Academic Performance, Learning Environment, and Efficiency (Division of School Improvement, 2003). Each of the nine standards includes a number of indicators, ranging from 5 to 16. The indicators are listed in KDE (2004d), *Standards and Indicators for School Improvement: A Kentucky Model for Student-Centered Accountability*.

Academic Performance

Standard 1 (Curriculum): The school develops and implements a curriculum that is rigorous, intentional, and aligned to state and local standards.

Standard 2 (Classroom Evaluation/Assessment): The school uses multiple evaluation and assessment strategies to continuously monitor and modify instruction to meet student needs and support proficient student work.

Standard 3 (Instruction): The school's instructional program actively engages all students by using effective, varied and research-based practices to improve student academic performance standards.

Learning Environment

Standard 4 (School Culture): The school/district functions as an effective learning community and supports a climate conducive to performance excellence.

Standard 5 (Student, Family and Community Support): The school/district works with families and community groups to remove barriers to learning in an effort to meet the

intellectual, social, career, and developmental needs of students.

Standard 6 (Professional Growth, Development and Evaluation): The school/district provides research-based, results driven professional development opportunities for staff and implements performance evaluation procedures in order to improve teaching and learning.

Efficiency

Standard 7 (Leadership): School/district instructional decisions focus on support for teaching and learning, organizational direction, high performance expectations, creating a learning culture, and developing leadership capacity.

Standard 8 (Organizational Structure and Resources): The organization of the school/district maximizes use of time, all available space and other resources to maximize teaching and learning and support high student and staff performances.

Standard 9 (Comprehensive and Effective Planning): The school/district develops, implements and evaluates a comprehensive school improvement plan that communicates a clear purpose, direction and action plan focused on teaching and learning.

APPENDIX B

INTERSTATE SCHOOL LEADER LICENSURE CONSORTIUM STANDARDS

Appendix B

Interstate School Leader Licensure Consortium Standards

The core curriculum for leadership of schools for the Commonwealth of Kentucky is grounded in the *Standards and Indicators for School Improvement* (SISI). With references and relationships to the standards of the Interstate School Leadership Licensure Consortium (ISLLC), the goals of The Kentucky Board of Education, a specific focus on SISI Standard 7 (Leadership), and the Technology Standards for School Administrators, these curriculum documents provide a map by which Kentucky school leaders can move toward greater effectiveness as instructional leaders and increasing gains in student achievement (KDE, n.d.). The ISLLC Standards are listed below. A complete list of ISLLC indicators for each standard may be found on the KDE website or by consulting the Council of Chief State School Officers (1996).

Standard 1: A school administrator is an educational leader who promotes the success of all students by facilitating the development, articulation, implementation, and stewardship of a vision of learning that is shared and supported by the school community.

Standard 2: A school administrator is an educational leader who promotes the success of all students by advocating, nurturing, and sustaining a school culture and instructional program conducive to student learning and staff professional growth.

Standard 3: A school administrator is an educational leader who promotes the success of all students by ensuring management of the organization, operations, and resources for a safe, efficient, and effective learning environment.

Standard 4: A school administrator is an educational leader who promotes the success of all students by collaborating with families and community members,

responding to diverse community interests and needs, and mobilizing community resources.

Standard 5: A school administrator is an educational leader who promotes the success of all students by acting with integrity, fairness, and in an ethical manner.

Standard 6: A school administrator is an educational leader who promotes the success of all students by understanding, responding to, and influencing the larger political, social, economic, legal, and cultural context.

APPENDIX C

SEVENTEEN LEVERAGE POINTS FROM 2000-2001 SCHOLASTIC AUDIT

Appendix C

Seventeen Leverage Points From 2000-2001 Scholastic Audit

The first round of scholastic audits/reviews (2000-2001) produced seventeen indicators designated as Leverage Points: indicators where results varied greatly from successful schools to Level 3 assistance schools. After the audits/reviews were completed in 2002-2003, the term “Leverage Point” was changed to “Variance Point” to describe more accurately the meaning of the term (Division of School Improvement, 2003). Listed below are the seventeen leverage indicators based on the data obtained from the 2000-2001 scholastic audits and reviews.

Standard 1, Curriculum

1.1d. There is evidence of vertical communication with an intentional focus on key curriculum transition points within grade configurations (e.g., from primary to middle and middle to high).

Standard 2, Assessment

2.1d. Test scores are used to identify curriculum gaps.

2.1h. Samples of student work are analyzed to inform instruction, revise curriculum and pedagogy, and obtain information on student progress.

Standard 3, Instruction

3.1b. Instructional strategies and learning activities are aligned with the district, school, and state learning goals and assessment expectations for student learning.

Standard 4, School Culture

4.1f. The school intentionally assigns staff to maximize opportunities for all students to have access to the staff's instructional strengths.

Standard 5, Student, Family and Community Support

5.1b. Structures are in place to ensure that all students have access to all the curriculum (e.g., school guidance, Family Resource/Youth Services Centers, Extended School Services).

5.1d. Students are provided with a variety of opportunities to receive additional assistance to support their learning beyond the initial classroom instruction.

Standard 6, Professional Growth, Development and Evaluation

6.1b. The school has an intentional plan for building instructional capacity through ongoing professional development.

6.2c. The school/district effectively uses the employee evaluation and the individual professional growth plan to improve staff proficiency.

6.2e. The school/district improvement plan identifies specific instructional leadership needs, has strategies to address them, and uses the Effective Instructional Leadership Act requirements as a resource to accomplish these goals.

6.2f. Leadership uses the evaluation process to provide teachers with the follow-up and support to change behavior and instructional practice.

Standard 7, Leadership

7.1c. There is evidence that all administrators have a growth plan focused on the development of effective leadership skills.

7.1d. There is evidence that the school/district leadership team disaggregates data for use in meeting the needs of a diverse population, communicates the information to school staff and incorporates the data systematically into the school's plan.

Standard 8, Organizational Structure and Resources

8.2b. The school/district budget reflects decisions made about discretionary funds and resources are directed by an assessment of need or a required plan, all of which considers appropriate data.

8.2c. School councils and school boards analyze funding and other resource requests to ensure the requests are tied to the school's plan and identified priority needs.

Standard 9, Comprehensive and Effective Planning

9.3b. The school/district analyzes their students' unique learning needs.

9.6b. The school evaluates the degree to which it achieves the goals and objectives for student learning set by the plan.

APPENDIX D

TWENTY-SEVEN VARIANCE POINTS FROM 2002-2003 SCHOLASTIC AUDIT

Appendix D

Twenty-seven Variance Points from 2002-2003 Scholastic Audit

Listed below are the twenty-seven indicators that were found to be variance points based on the data obtained from the 2002-2003 scholastic audits and reviews (KDE, 2006f).

Standard 1, Curriculum

1.1g. The curriculum provides access to a common academic core for all students.

Standard 2, Assessment

2.1d. Test scores are used to identify curriculum gaps.

2.1h. Samples of student work are analyzed to inform instruction, revise curriculum and pedagogy, and obtain information on student progress.

Standard 3, Instruction

3.1b. Instructional strategies and learning activities are aligned with the district, school, and state learning goals and assessment expectations for student learning.

3.1d. Teachers demonstrate the content knowledge necessary to challenge and motivate students to high levels of learning.

Standard 4, School Culture

4.1a. There is leadership support for a safe, orderly, and equitable learning environment (e.g., culture audits/school opinion surveys).

4.1b. Leadership creates experiences that foster the belief that all children can learn at high levels in order to motivate staff to produce continuous improvement in student learning.

4.1c. Teachers hold high expectations for all students academically and behaviorally; this is evidenced in their practices.

4.1d. Teachers and non-teaching staff are involved in both formal and informal decision-making processes regarding teaching and learning.

4.1e. Teachers recognize and accept their professional role in student success and failure.

4.1f. The school intentionally assigns staff to maximize opportunities for all students to have access to the staff's instructional strengths.

4.1h. There is evidence that the teachers and staff care about students and inspire their best efforts.

4.1i. Multiple communication strategies and contexts are used for the dissemination of information to all stakeholders.

4.1j. There is evidence that student achievement is highly valued and publicly celebrated (e.g., displays of student work, assemblies).

4.1k. The school/district provides support for the physical, cultural, socio-economic, and intellectual needs of all students which reflects a commitment to equity and an appreciation of diversity.

Standard 5, Student, Family and Community Support

5.1a. Families and the community are active partners in the educational process and work together with the school/district staff to promote programs and services for all students.

5.1d. Students are provided with a variety of opportunities to receive additional assistance to support their learning beyond the initial classroom instruction.

Standard 6, Professional Growth, Development and Evaluation

6.1c. Staff development priorities are set in alignment with the goals for student performance and the individual growth plans of staff.

6.1f. Professional development planning shows a direct connection to and analysis of student achievement data.

6.2c. The school/district effectively uses the employee evaluation and the individual professional growth plan to improve staff proficiency.

6.2d. Leadership provides and implements a process of personnel evaluation which meets or exceeds standards set in statute and regulation.

Standard 7, Leadership

7.1k. There is evidence that the principal demonstrates leadership skills in the areas of academic performance, learning environment, and efficiency.

Standard 8, Organizational Structure and Resources

8.1a. There is evidence that the school is organized to maximize use of all available resources to support high student and staff performance.

8.1c. The instructional and non-instructional staff are allocated and organized based on the learning needs of all students.

8.1d. There is evidence that the staff makes efficient use of instructional time to maximize student learning.

8.1f. The schedule is intentionally aligned with the school's mission and designed to ensure that all staff provide quality instructional time (e.g., flex time, organization based on the developmental needs of students, interdisciplinary units, etc.).

Standard 9, Comprehensive and Effective Planning

9.4b. The school/district goals for building and strengthening the capacity of the school/district instructional and organizational effectiveness are defined.

APPENDIX E

SIX COMMON VARIANCE POINTS

Appendix E

Six Common Variance Points

The following six Common Variance Points were found in both the 2001-2002 and 2002-2003 scholastic audits and reviews (Division of School Improvement, 2003).

Standard 2, Assessment

2.1d. Test scores are used to identify curriculum gaps.

2.1h. Samples of student work are analyzed to inform instruction, revise curriculum and pedagogy, and obtain information on student progress.

Standard 3, Instruction

3.1b. Instructional strategies and learning activities are aligned with the district, school, and state learning goals and assessment expectations for student learning.

Standard 4, School Culture

4.1f. The school intentionally assigns staff to maximize opportunities for all students to have access to the staff's instructional strengths.

Standard 5, Student, Family and Community Support

5.1d. Students are provided with a variety of opportunities to receive additional assistance to support their learning beyond the initial classroom instruction.

Standard 6, Professional Growth, Development and Evaluation

6.2c. The school/district effectively uses the employee evaluation and the individual professional growth plan to improve staff proficiency.

APPENDIX F

ELEVEN COMMON VARIANCE POINTS

Appendix F

Eleven Common Variance Points

The standard indicators that consistently emerged as Common Variance Points in all three accountability cycles (2000-2001, 2002-2003, 2004-2005) are listed below (KDE, 2006f). It should be noted that after the last cycle of audits, KDE changed the criteria for determining when the audit scores on a specific indicator were significantly different when compared across high and low achieving schools. This explains the discrepancy in the Common Variance Points between Appendix E and Appendix F.

Standard 2, Assessment

2.1g. Implementation of the state-required Assessment and Accountability Program is coordinated by school and district leadership.

Standard 4, School Culture

4.1a. There is leadership support for a safe, orderly, and equitable learning environment (e.g., culture audits/school opinion surveys).

4.1h. There is evidence that the teachers and staff care about students and inspire their best efforts.

Standard 6, Professional Growth, Development and Evaluation

6.2a. The school/district provides a clearly defined evaluation process.

6.2b. Leadership provides the fiscal resources for the appropriate professional growth plan to improve staff proficiency.

6.2d. Leadership provides and implements a process of personnel evaluation which meets or exceeds standards set in statute and regulation.

Standard 7, Leadership

7.1c. There is evidence that all administrators have a growth plan focused on the development of effective leadership skills.

7.1e. Leadership ensures all instructional staff has access to curriculum related materials and the training necessary to use curricular and data resources relating to the learning

goals for Kentucky public schools.

7.1g. Leadership plans and allocates resources, monitors progress, provides organizational infrastructure and removes barriers in order to sustain continuous school improvement.

7.1h. The school/district leadership provides the organizational policy and resource infrastructure necessary for the implementation and maintenance of a safe and effective learning environment.

7.1k. There is evidence that the principal demonstrates leadership skills in the areas of academic performance, learning environment, and efficiency.

APPENDIX G

HUMAN SUBJECTS APPROVAL

HUMAN SUBJECTS PROTECTION
PROGRAM OFFICE

University of Louisville
MedCenter One, Suite 200
501 E. Broadway
Louisville, Kentucky 40202-1788

Office: 502-682-6186
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February 16, 2007

Dr. Stephen K. Miller
LFHRE- Belknap Campus
University of Louisville
Louisville, KY 40282

EXEMPT

RE: 088.077 Leadership, Curriculum, Instruction, and
Accountability Scores: Evidence from Kentucky Scholastic Audits

Dear Dr. Miller:

The above study has been received by the Human Subjects Protection Program Office. It has been determined by the chair of the Institutional Review Board that the study is exempt according to 45 CFR 46.101(b) 2 since the research involves the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available or if the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects. The study is exempt only if information that could identify subjects is not recorded.

This study was also approved through 45 CFR 46.116 (D), which means that it has been granted a waiver of informed consent because it meets the following criteria:

- The research involves no more than minimal risk to the subjects.
- The waiver or alteration will not adversely affect the rights and welfare of the subjects.
- The research could not practicably be carried out without the waiver or alteration.
- Whenever appropriate, the subjects will be provided with the additional pertinent information after participation.

The purpose of this study is to determine the effect of school leadership (principals) on school success.

Since this study has been found to be exempt, no additional reporting, such as submission of Progress Reports for continuation reviews, is needed. Best wishes for a successful study. Please send all inquiries and electronic revised/requested items to our office email address at hspofc@louisville.edu.

Sincerely,

Patricia K. Leitsch, Ph.D., Chair,
Social/Behavioral/Educational Institutional Review Board

PKL/cm

Human Subjects Review Board
Office of Sponsored Programs
270 745-4652
FAX: 270-745-4211
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Western Kentucky University
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The Spirit Makes the Master

In future correspondence please refer to HS07-146, February 26, 2007

Dr. Douglas Smith
Department of Sociology
WKU

Dear Dr. Smith:

Your revision to your research project, "Leadership, Curriculum, Instruction, and Accountability Scores: Evidence From Kentucky Scholastic Audits," was reviewed by the HSRB and it has been determined that risks to subjects are: (1) minimized and reasonable; and that (2) research procedures are consistent with a sound research design and do not expose the subjects to unnecessary risk. Reviewers determined that: (1) benefits to subjects are considered along with the importance of the topic and that outcomes are reasonable; (2) selection of subjects is equitable; and (3) the purposes of the research and the research setting is amenable to subjects' welfare and producing desired outcomes; that indications of coercion or prejudice are absent, and that participation is clearly voluntary.

1. In addition, the IRB found that you need to orient participants as follows: (1) signed informed consent is not required as data is being retrieved from a secondary source; (2) Provision is made for collecting, using and storing data in a manner that protects the safety and privacy of the subjects and the confidentiality of the data. (3) Appropriate safeguards are included to protect the rights and welfare of the subjects.

This project is therefore approved at the Exempt Review Level

2. Please note that the institution is not responsible for any actions regarding this protocol before approval. If you expand the project at a later date to use other instruments please re-apply. Copies of your request for human subjects review, your application, and this approval, are maintained in the Office of Sponsored Programs at the above address. Please report any changes to this approved protocol to this office.

Sincerely,

Sean Rubino, M.P.A.
Compliance Manager
Office of Sponsored Programs
Western Kentucky University

cc: HS file number Smith HS07-146
cc: Lonnie McKinney

APPENDIX H

REGRESSION OF STANDARD INDICATORS

Appendix H

Regression of Standard indicators

Table H1

Regression of the Academic Index on Curriculum Indicators (N = 181)

Variable	<i>B</i>	<i>SE B</i>	Beta	<i>t</i>	Sig. <i>t</i>
Constant	52.77	1.55		34.099	< .001
1.1a	-.49	.54	-.07	-.910	.364
1.1b	-.97	.65	-.12	-1.485	.139
1.1c	-.35	.62	-.05	-.565	.573
1.1d	2.80	.62	.35	4.518	.001
1.1e	1.56	.54	.23	2.924	.004
1.1f	.47	.63	.06	.744	.458
1.1g	1.87	.63	.26	2.970	.003

Table H2

Regression of the Academic Index on Instruction Indicators (N = 181)

Variable	<i>B</i>	<i>SE B</i>	Beta	<i>t</i>	Sig. <i>t</i>
Constant	46.51	1.72		27.031	< .001
3.1a	.41	.75	.05	.543	.588
3.1b	1.53	.61	.20	2.507	.013
3.1c	.47	.84	.05	.565	.573
3.1d	1.45	.54	.21	2.694	.008
3.1e	1.55	.60	.18	2.592	.010
3.1f	1.266	.52	.18	2.446	.015
3.1g	-1.19	.64	-.13	-1.847	.066
3.1h	.80	.57	.10	1.395	.165

Table H3

Regression of the Academic Index on Leadership Indicators (N = 181)

Variable	<i>B</i>	<i>SE B</i>	Beta	<i>t</i>	Sig. <i>t</i>
Constant	50.99	2.18		23.437	< .001
7.1a	-.42	.27	-.06	-.734	.464
7.1b	.73	.71	.10	1.032	.304
7.1c	.44	.48	.07	.906	.366
7.1d	-7.561E-02	.62	-.01	-.122	.903
7.1e	.817E-02	.64	.01	.060	.953
7.1f	.25	.56	.04	.451	.653
7.1g	1.11	.81	.18	1.368	.173
7.1h	-.39	.61	-.06	-.645	.520
7.1i	.57	.63	.08	.909	.365
7.1j	1.37	.68	.20	2.012	.046
7.1k	.61	.66	.10	.923	.357

CURRICULUM VITAE

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& TRAINING: B.S., Industrial Education
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