Career and Technical Education: The Impact of Leadership On School Improvement and Student Achievement

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CAREER AND TECHNICAL EDUCATION: THE IMPACT OF LEADERSHIP ON SCHOOL IMPROVEMENT AND STUDENT ACHIEVEMENT

A Dissertation
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Doctor of Education

By
Eric T. Keeling

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CAREER AND TECHNICAL EDUCATION: THE IMPACT OF LEADERSHIP ON SCHOOL IMPROVEMENT AND STUDENT ACHIEVEMENT

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DEDICATION

This dissertation is dedicated to

God,

Your grace makes me possible;

To my adorable wife, Melanie, your support, patience, and encouragement made this educational pursuit possible. You are an amazing mother who continues to be the best role model for our daughter. Thank you for being my rock.

Madeline C. Keeling
(My wonderful daughter)

Whom I love with all my heart. I will make up for those lost Saturdays!

Rev. James William Keeling (deceased) and Mrs. Connie Keeling
(My parents)

Who instilled in me the value of an education and the tenacity to finish what I start;

Jimmy (deceased) and Scott Keeling
(My brothers)

Thank you for always being there
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The Kentucky Department of Education’s (KDE) College and Career Readiness (CCR) Model elevated CTE in the public education arena forcing a paradigm shift in the administration of CTE across the Commonwealth. Instructional leadership and school improvement are viewed as important components of CCR. The perceptions of teachers concerning school improvement and the leadership behaviors exhibited by principals are essential in the daily operation of CTE schools. The purpose of the current study was to provide a body of knowledge revealing the relationships among Leadership, Instruction, and Student Achievement in the CTE setting.

KDE adopted the Standards and Indicators for School Improvement (SISI) as the primary guideline for whole school reform in the public school system (KDE, 2004d). The nine standards and 88 indicators established guidelines for successful schools and student achievement. The Standards and Indicators Scholastic Review (SISR) survey is an adaptation of the SISI and was designed by a research team at Western Kentucky University to measure school improvement. Miller, Chon, Houchens, and Hunt (2013) suggested the enhanced version has the potential to serve as a reliable instrument that measures teacher perceptions concerning the 9 Standards and indicators of the SISI.
The current study utilized the SISR survey in the CTE setting. The study was distributed to CTE teachers in the three School Types: KY TECH Area Technology Centers, locally controlled career centers, and CTE programs in the comprehensive high schools. The investigation utilized demographic control factors along with the SISR to compare influences of Leadership (Standard 7) on Instruction (Standard 3) as measured by student achievement in the CTE setting. Central to the study is the role of leadership in CTE schools.

Descriptive statistics, t-test, ANOVAs, and Pearson r were utilized to determine differences and relationships between the demographic factors, Leadership (Standard 7), and Instruction (Standard 3). The quantitative study examined the relationship between Leadership and Instruction as it pertains to Student Achievement. The results of the study revealed that the SISR is an effective measure in the CTE setting, there is a strong correlation between Leadership and Instruction, and Leadership and Instruction share a statistically significant relationship with student achievement. Conversely, the study revealed relatively minimal research surrounding CTE, Instructional Leadership, and Student Achievement. The results indicated that additional research in CTE is needed on the state level to guide the CCR movement in Kentucky.
CHAPTER I: INTRODUCTION

Leadership in corporate America has been the target of scrutiny for the last two decades. High profile leadership failures have created a climate of mistrust and hesitation (Kouzes & Posner, 1987). The high levels in attrition of employee and leader relationships have forced educational institutions to revisit their formal preparation programs. The renewed focus on emotional intelligence, behavior traits, and transformational versus transactional leadership has overwhelmed businesses struggling to be competitive in a global economy. This development in leadership was not isolated to corporate America; the public education system has been facing parallel issues. School leaders are consistently scrutinized for daily decisions that impact student success (Ennis, 2002).

The education system in America is engulfed in a transformation process to be globally competitive. Corporate America has identified the key to business success on a global scale hinges on the education of the youth. While traditional education has prepared youth in the past, global innovation and technology requires teachers and administrators to incorporate teaching strategies that excite today’s students. Legislators have acknowledged the need by providing additional funding to support the demand. However, the funding was provided with an expectation of a return on investment. The high stakes accountability model forced the Kentucky Department of Education (KDE) and the Office of Career and Technical Education (OCTE) to redesign the framework for educating the youth of Kentucky.

Kentucky’s College and Career Readiness Model shifted the function of the building principal to an instructional leader who maintains a focus on student
achievement. The expectation of the principal to sustain a climate of effective instructional leadership and continuous improvement has been elevated to new levels. While the College and Career Readiness (CCR) Model transformed leadership in the academic setting, one of the five components is career readiness and this excited upper level leadership in OCTE. Winkler (2012) noted that the OCTE viewed the new role in the accountability model as an opportunity for Career and Technical Education (CTE) to excel in the education system. Winkler suggested that CTE impact two of the five accountability areas: career readiness and dropout rate.

CTE teachers may have significant influence on student achievement based on the CCR Model. Darling-Hammond (1998) suggested that the quality of teachers can be the most powerful predictor of student achievement. In order for teachers to perform at elevated levels, principals are expected to exhibit traits associated with instructional leadership. Kouzes and Posner (2007) suggested that great leaders inspire, model, and encourage followers. The OCTE in Kentucky has not pursued the impact of principals on school improvement or student achievement.

The current study investigates the impact of leadership on school improvement in the CTE setting. CTE teachers’ perceptions concerning school improvement and the leadership behaviors that principals feel are critical in the daily operation of the CTE schools have become controversial topics. Blase and Blase (2000) asserted that teacher perceptions of effective instructional leadership are critical to school improvement. CTE teacher perceptions of their positions, educational level, previous work experience, content area taught, and their teacher preparation program influence their understanding of instructional leadership and school improvement. These factors are important
components of the program assessment, which has been the evaluation model for CTE for the past two decades (H. D. Winkler, personal communication, July, 18, 2013).

KDE adopted the Standards and Indicators for School Improvement (SISI), which included 9 Standards and 88 Indicators, as the primary guidelines for successful schools and student achievement in the public school system (KDE, 2004d). The Scholastic Audit also was created to determine the level of implementation for the SISI. Low-performing schools were selected for audit via an invasive site visit. The weeklong Scholastic Audit was expensive and imposing, which became disruptive to the educational process. Due to these factors, the Scholastic Audit has been discontinued.

The Standards and Indicators Scholastic Review (SISR) is a modification of the Scholastic Audit designed by a research team at Western Kentucky University. Miller, Chon, Houchens, and Hunt (2013) suggested that the enhanced version can be completed through a 45-minute survey during a faculty meeting, given adequate instruction. The current study will incorporate the SISR in the CTE setting, which to date has never been attempted. The investigation will utilize demographic control factors, along with the SISR, to compare influences on student achievement from selected standards of the new SISR. Central to the study is the role of leadership in CTE schools.

The Problem Defined

The CCR Model has generated changes and transformations at KDE. This accountability model has forced principals to reconsider leadership styles and approaches. Costellow (2011) asserted that in recent years, the responsibilities of the building principal in the academic setting have shifted from a focus on facilities management, scheduling, and meetings to a focus on instructional leadership and school
improvement. Principals in OCTE are expected to perform under similar auspices of leadership. The CCR initiative has forced CTE principals to spend more time in support of school improvement and teacher effectiveness. Principals exert energy and deplete resources in order to provide teachers with professional development that supports classroom instruction. Dufour and Eaker (1992) supported this transition and suggested that instructional leadership traits are important to the school improvement initiative. While this philosophy has been around for 23 years, the CCR Model requires principals to formally adopt the approach to lead student achievement and school improvement.

CTE programs are evaluated for effectiveness every two years. OCTE implemented a 17-standard program assessment instrument utilized by CTE teachers to document their performance in the classroom. This instrument is considered to be the template for school improvement in the area technology centers. KDE utilized the Program Review for CTE programs in the high school and in local career centers. The Program Review is comparable to the Program Assessment process; however, inconsistencies exist. The Program Assessment process, while similar to the Program Review, requires documentation of the 17 standards, but does not capture the quality of the program or teacher as it relates to instruction and school improvement. Thus, the inconsistencies and inadequacies require further examination.

Program Assessment

The Program Assessment document has been the primary instrument utilized to measure school improvement in area technology centers in Kentucky. H. D. Winkler, Associate Commissioner for the Office of Career and Technical Education (personal communication, January 12, 2013), explained,
The program assessment model has been utilized by OCTE for over two decades. The model is loosely based on the SISI and provides the quality standards for our system. The instrument measures school effectiveness and provides the foundational pieces for school improvement in CTE. However, the instrument measures neither the mediated leadership exhibited by CTE principals or their impact on school improvement in the CTE setting.

CTE teachers participated in activities in an effort to meet the standard for the Program Assessment. The fidelity of the standard too often was disregarded, and the emphasis shifted to the documentation (Winkler, 2012). Murphy and Hallinger (1988) suggested that strategies to improve instructional leadership in schools may be constructive. Sahin (2011) noted that instructional leadership is essential to a positive school culture and is significant to school improvement. However, such activities should guide actual implementation rather than serving as a template that is filed but never acted upon. This also does not replace the need for research to investigate the impact of teacher effectiveness and school improvement efforts. With the CTE Program Assessment document, no formal measure is included on the effectiveness of the instruction. Furthermore, OCTE has no formal external program for measuring the impact of instruction on school improvement. The current study addresses that issue as well. Further studies regarding the SISI in the CTE setting are needed to determine the relationship between Leadership (Standard 7) and accountability outcomes for CTE students (Work Keys, Kentucky Occupational Skills Standards Assessment (KOSSA), and Industry Certificates), controlling for the demographic factors by school classification, as mediated by Instruction (Standard 3).
Standards and Indicators for School Improvement

KDE (2003) introduced the SISI as the primary mechanism for measuring school improvement. The SISI contains 9 Standards and 88 Indicators that measure whole school improvement and serves as an instrument to reveal growth areas for school improvement. The Standards are divided into three categories: Academic Performance, Learning Environment, and Efficiency (KDE, 2003). The Indicators detail the specific tasks or activities that make up each standard. KDE also developed the Scholastic Audit to measure a school’s performance on the Standards, with each indicator delineated on a 4-point scale to determine effectiveness in a particular area. The SISI can reveal the mediating effect of instructional leadership on student achievement through the principal’s efforts in curriculum, assessment, and instruction, or more globally through a focus on developing a better learning climate. A shared vision, empowered teachers, and interconnectedness lead to a culture that fosters strong student-teacher relationships (Sahin, 2011), all factors that can be influenced by leadership.

Holliday (2013) noted that the CCR initiative has exposed areas of growth in the career and technical education system as a whole. H. D. Winkler (personal communication, July 18, 2013) has indicated that the teacher preparation program for instruction and the principal’s demonstrated instructional leadership traits that are necessary to meet the accountability measures present challenges for central office administration. Research connecting the SISI to the CTE system may help to understand these deficits. However, the SISI framework has not been applied directly to the CTE schools.
Leadership in CTE Schools

Barker (2007) contended that a building leader has the potential to influence student outcomes through innovative strategies that align with research-based standards. Winkler (2012) asserted that in the KY TECH system, a school that performs well on the Program Assessment Standards is assumed to be meeting school improvement indicators. Conversely, teachers’ knowledge of the standards represented in the program assessment and their role in school improvement may be limited. While teachers are meticulous in the documentation of the standards, they often are unclear about the leadership that drives the initiatives supporting the documentation. This process is particularly difficult for new teachers.

The CTE teacher preparation program includes a six-hour session on the program assessment process and follows with an annual professional development activity. Within the CTE model, instructional leadership has not been formally measured or assessed. In contrast, McKinney’s (2007) study revealed that instructional leadership in the state’s academically oriented schools is a critical component to school improvement. His focus on curriculum and instruction exposed the need for instructional leadership in the role of building principal at the elementary level, a finding confirmed by Todd (2010) at the secondary level. The investigator of the current study has found no research indicating that the SISI has been used to measure or evaluate schools within the OCTE.

Instructional Leadership

The Council of Chief State School Officers (CCSSO, 1996) established a set of standards for school leaders beginning in 1996. Personnel from state education agencies and profession educational entities in over 24 states founded the Interstate School
Leaders Licensure Consortium (ISSLC). This group established standards (Murphy, 2004) that represented a unilateral understanding of leadership and the traits associated with influence, temperament, and skill sets exhibited by strong educational administrators. Kentucky requires aspiring principals to meet benchmarks on a written exam constructed from these standards (KDE, 2014). The ISLLC exam assesses the following standards (CCSSO, 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. (p. 10-21)

The ISLLC Standards shaped leadership in the Kentucky public education school system. As school administrators satisfied the standard of effective leadership by meeting benchmarks on ISLLC, there is no evidence that professional development opportunities were in place to sustain the skill sets that were developed (Ennis, 2007). These inconsistencies in leadership encouraged policymakers to develop legislation supporting continuous improvement for educational administrators. The Effective Instructional Leadership Act (EILA) Technical Assistance Manual (KDE, 2006b) was created as a guide for Kentucky principals in the public school system provides the following legislative support:

   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. (p. 4)

Educational administrators are required to complete 25 hours of EILA credit each year to maintain Kentucky Administrator Certification through the Kentucky Educational Professional Standards Board (EPSB).
The OCTE previously required CTE principals to complete a Vocational Principal Certification through the EPSB that consisted of 15 college credit hours at a state university. The program transitioned to a full Master of Science Degree in Vocational Education Administration. According to Winkler (2012), the program requirements for the OCTE were aligned in 2012 with KDE K-12 Educational Administration Certification (Master of Science and Rank I in Kentucky K-12 Educational Administration). While the new requirements encourage instructional leadership, the traditional career and technical education teachers are discouraged by the additional coursework (Arnold, 2013). Current CTE educational administrators who were trained under the old system may be deficient as instructional leaders. Principals in the CTE system who lack instructional leadership traits are expected to effect change, promote school improvement, and increase student achievement in the current arena of high stakes accountability. This paradigm is emerging as a norm in the KY TECH system and KDE as a whole (Hollday, 2013).

CTE teachers are considered experts in their trade or technical content areas and are comfortable teaching in a lab setting, which includes teaching students through kinesthetic activities and manipulatives. In response to the new model, they are expected to spend more time teaching their vocational content area in the traditional classroom setting utilizing books and desks while incorporating academics such as math, Literacy, and Science standards during lecture. Generally, CTE teachers are more effective when utilizing a “hands-on” approach to engage students (Arnold, 2013). According to Winkler (2012) academic standards are embedded into the CTE curriculum to emphasize real life applications in the CTE setting. Professional development opportunities are
provided on local and state levels to encourage buy-in from teachers and tools to incorporate the standards into their daily lessons. In an effort to support and foster these initiatives, instructional leadership is required. However, through internal promotion, these teachers progress to the principal level and are expected to provide instructional leadership to the teachers they lead when they are not familiar with the model. Schools in the traditional academic setting are experiencing a parallel situation.

This endeavor is creating challenges within the KY TECH system and is exposing the need for an evaluation model that incorporates the standards of the SISI (Winkler, 2013). Yet, the body of research is deficient relative to the relationship between career and technical education leadership traits and school improvement. In a review of the literature, minimal research was found in this area for the KY TECH system. Additional studies are needed to provide evidence of the demographic factors, school types, and leadership traits that have the greatest influence on student achievement, specifically for KY TECH area technology center teachers, locally controlled career centers, and CTE teachers in the comprehensive high school setting.

Since its increased emphasis in recent years, instructional leadership, as a concept, has been a critical issue for KY TECH. However, only in the last few years has effective instructional leadership been viewed within KDE as essential for the success of career and technical education endeavor. Bass (1999) suggested that successful principals who focus on school improvement require a stronger understanding of the traits of an effective instructional leader and an awareness of the traits more likely to be exhibited on a regular basis. For example, Blase and Blase (2000) conducted a study of over 800 teachers who identified leadership traits of their principals that enriched their classroom instruction.
The study exposed two themes in instructional leadership: (a) the promotion of reflection over effective teaching practices, and (b) the promotion of professional development.

KDE focus on Career Readiness has established CTE as a necessary elective in the transition to the workforce by students. This focus on Career Readiness is driving CTE teachers to a higher level of accountability.

A shift has been noted in school leader preparation programs as well across the United States (Davis & Darling-Hammond, 2012). Instructional leadership has become a priority in an attempt to reach students, while meeting state accountability measures. The management style of leadership associated with male principals has been replaced with the traits of nurturing, caring, and instructional leadership, which are generally associated with females (Barber & Meyerson, 2007). Recently, the OCTE has seen an increase in female principals. The suggestion that this shift has improved instructional leadership for CTE is being accepted by existing principals (Winkler, 2012). Conversely, improvements have not met the demand for influential school leaders within the system. The deficiencies in the development of instructional leaders for CTE have become a cyclical challenge. CTE teachers have not been given the opportunity to have work under instructional leaders; therefore, they may lack the vision necessary to lead school improvement initiatives when they move into the role of school leader. Equally, some principals from academic backgrounds may lack the technical skill sets necessary to become effective instructional leaders in CTE schools (Winkler, 2012). Thus, these factors demonstrate the need for additional research on instructional leadership in CTE.

Barker (2007) suggested, “Energetic, visionary leadership, a focus on the individual student, the active use of performance data, a broad and flexible curriculum,
and enhanced status and resources contributed to a climate where teachers were prepared to go ‘the extra mile’” (p. 24). These concepts are universal and applicable to both traditional academic settings teaching math, English, and science, and in the CTE settings that include trade and technical content areas. However, while research is plentiful concerning the investigation of instructional leadership in the traditional academic setting, essentially no research was available regarding instructional leadership for career and technical education in Kentucky. Specifically, the Program Assessment model includes no formal measure for instruction. The SISI provides this formal linkage between Instruction (Standard 3) and Leadership (Standard 7), yet only McKinney (2007) and Todd (2010) have studied this relationship; no one has applied the SISI framework to CTE schools.

**The Standards and Indicators Scholastic Review**

The SISI is a framework for whole school, standards-based reform. Although the SISI provides the link between leadership and instruction that is needed for CTE schools, utilization of the process is no longer feasible. KDE discontinued the Scholastic Audit, primarily due to the excessive costs and time required to administer the week-long external visit, which established the evaluation as prohibitive (Miller et al., 2013).

Miller et al. (2013) argued that the SISR may effectively replace the Scholastic Audit process for KDE schools. The SISR contains teacher perceptual scales designed to capture the information from the external Scholastic Audit through a 45-minute survey instrument. The pilot study to validate the new instrument is now complete for the eight schools in the GRREC region. The results demonstrate the new instrument to be both valid and predictive of student achievement. In fact, the SISR was more than twice as
effective as the original Scholastic Audit in explaining differences in school level achievement (Miller, Houchens, Smith, Chon, & Hunt, 2014). However, the results must be viewed cautiously due to the small sample ($N = 8$) in the pilot study.

Based on the results of the Miller et al. (2014) study, the SISI has been revised (SISR), and the SISR has been reduced from 68 to 63 indicators for further research (Miller et al., 2014). A second validation study of 30 schools utilizing the revised SISR is in progress, and no further research has been conducted using this revised SISR.

Although such studies are planned for the fall of 2015 in Kentucky’s academic schools, none have been conducted with CTE schools utilizing the SISI framework generally. Thus, a study is needed concerning CTE school use of the revised SISR, specifically focused on instruction and leadership.

**Purpose and Methodology Overview**

The current study brings together the issues detailed in the previous section. Specifically, this research initially considers the Program Assessment process utilized to evaluate KY TECH centers and the fact that no external programs exist for assessing the influence of instruction on school improvement in the CTE setting. Second, the current study also investigates the issue that the SISI instrument has not been formally used to expose growth areas or to evaluate CTE schools. Third, leadership in the CTE school setting has not been evaluated as it relates to student achievement. The current study exposes the level of instructional leadership exhibited by principals, as perceived by CTE teachers in the Kentucky public education school system in their respective settings. Finally, the SISR is utilized to evaluate the control factors of gender, race, education level, teaching experience, content area, type of school; leadership, Standard 7
(Leadership) and Standard 3 (Instruction); and the accountability outcomes of Work Keys, KOSSA, and Industry Certifications for three settings: the KY TECH school system, career centers, and local high school CTE programs.

Therefore, the purpose of this study was to analyze the impact of a mediated model of leadership on student achievement through its effect on instruction. The SISR was the primary instrument utilized to gather data (Miller et al., 2014). The SISR was distributed to CTE teachers in the KY TECH area technology centers, locally controlled career centers, and those in the public school setting. Due to the lack of empirical evidence surrounding CTE and school improvement, the study design included demographic factors. Miller et al. (2014) suggested that the SISR measures teacher perceptions concerning school improvement, thus providing a window into relationships that may exist between school-level demographic factors (e.g., teacher preparation in CTE schools and type of CTE school), the targeted standards from the SISR (Leadership and Instruction), and student achievement.

This quantitative research study also addressed leadership behaviors specifically associated with instruction relative to their effect on student achievement in CTE schools. The SISR instrument was distributed online via Qualtrics to all teachers in each CTE school setting in Kentucky. The research design is correlational and incorporates a causal comparative analysis of the three types of CTE schools. Multiple correlations and ANOVA were the primary statistical analyses employed. Providing insight into CTE teacher perceptions, this knowledge may help to provide the following: (a) a foundation for the renovation of the school improvement process for the OCTE in Kentucky, (b) evidence to support a new teacher preparation program in the KY TECH system, and (c)
evidence to support the need for the development of instructional leadership traits in CTE principals. Table 1 depicts a Logic Model of the conceptual relationship among the variables considered in this research.

Table 1

Logic Model for Effects of Leadership (Standard 7) on CTE School Outcomes, as Mediated by Instruction (Standard 3).

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Dependent Variable</th>
</tr>
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<tbody>
<tr>
<td>Control</td>
<td>Efficiency</td>
</tr>
<tr>
<td>Gender</td>
<td>SISR Standard 7</td>
</tr>
<tr>
<td>Race/Ethnicity</td>
<td>Leadership</td>
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<tr>
<td>Education Level</td>
<td></td>
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<tr>
<td>Teaching Experience</td>
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<tr>
<td>Content Area</td>
<td></td>
</tr>
<tr>
<td>Types of Schools</td>
<td>KY TECH Career Centers</td>
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<tr>
<td></td>
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</tbody>
</table>

**Research Questions**

The current study analyzed the effects of building-level leadership on student achievement, as represented by Work Keys scores, KOSSA scores, and Industry Certification in the CTE setting. The SISR will be used to gather data that will allow the investigation of potential relationships among demographic factors specific to CTE schools, Leadership (Standard 7), Instruction (Standard 3), and CTE student outcomes.
The central research question is as follows: To what extent is instructional leadership related to accountability outcomes in CTE schools?

The following empirical research questions will guide this study:

1. To what degree do demographic factors relate to teacher perceptions of the Standard 7 (Leadership), Standard 3 (Instruction), and the Career Readiness Accountability Measures in Kentucky?
2. To what degree does Standard 7 (Leadership) relate to Standard 3 (Instruction) and Career Readiness Accountability Measures in Kentucky?
3. To what degree do Standard 7 (Leadership) and Standard 3 (Instruction) relate to Career Readiness Accountability Measures in Kentucky?
4. To what degree does Standard 3 (Instruction) mediate the effect of Standard 7 (Leadership) on the Career Readiness Measures in Kentucky, controlling for demographic factors?

**Significance of Study**

The SISR pilot study that was conducted in the academic setting by Miller et al. (2014) revealed interesting results. While the number of pilot schools was small, the results showed significant correlations between the SISI and student achievement. In this study, all nine of the standards within the SISI held up through the factor analysis and reliability testing.

First, the results establish the SISR as a valid instrument, suggesting that the new tool can replace the Scholastic Audit or perhaps the Program Assessment for CTE. This study has not been conducted in the CTE setting, yet the results in the traditional academic setting including math, English, and science classrooms are promising. The
current research may challenge the current evaluation process for CTE, while establishing whole school reform as a priority within the system.

Second, the current study helps establish the relationship between instructional leadership and student achievement in the CTE schools. The mediated effect of the school leader on instruction in CTE programs was revealed, establishing a benchmark for professional development programs state wide. The comparison of teacher perceptions concerning school leader implementations and effectiveness may uncover discrepancies in leadership behavior, and the demographic factors may divulge discrepancies within the various teacher preparation programs (and other demographic categories) and their impact on instructional leadership.

Finally, previous studies that were based on the SISI and the Scholastic Audit on the high school level were limited to the research by Todd (2010). The research targeted academic high schools and excluded CTE programs and evaluation processes. This appears to be the only study of its kind for CTE in Kentucky. The current research will reveal teacher perceptions concerning instructional leadership and the standards they feel have the greatest impact on student achievement. Winkler (personal communication, July 12, 2014) was receptive to the research and the SISR as a viable component of the evaluation system for CTE schools.

**Limitations of Study**

The OCTE earned accreditation for all 53 schools in the KY TECH System through Advanced Ed, a standards-based accrediting agency for Southeastern United States schools and colleges. The Program Assessment evaluation instrument was utilized to achieve this status for all CTE schools. KY TECH was the first CTE district in the
nation to earn this classification. One limitation of the current study may result from existing leadership on the central office level and seasoned teachers who support the current evaluation system. Patrons may maintain loyalty to the Program Assessment model and resist any changes to the status quo by refusing to participate. If they do participate, this allegiance may bias their responses.

A second limitation is the context of the SISR, which is designed to measure SISI standards as they relate to the Scholastic Audit. While the Program Assessment and Scholastic Audit are similar, no direct correlation exists between the two assessment models. The SISR will be used to measure teacher perceptions in the CTE setting, who may feel that the questions do not pertain to their program due to the context of the questions.

Finally, data were collected through three venues: KY TECH ATCs, locally controlled career centers, and high school CTE programs. Due to Winkler’s (personal communication, July 18, 2013) support, the response rate for the ATC’s and Career Centers was expected to be much higher than that of the high school CTE programs. The variances resulted in an adjustment in the sample from school types to balance the analysis. This creates an additional limitation within the study.

Summary

KDE and the OCTE merged in 2012, which generated multiple challenges for both entities. Under the umbrella of KDE, the role of the CTE principalship was modified to address the high stakes accountability associated with student achievement. Career Readiness is a component of the accountability formula and has elevated CTE in the public education model. The Program Assessment process documents are the means
by which CTE teachers address each of the 17 standards that lead to career readiness and, ultimately, student achievement. Winkler (2012) asserted that the Program Assessment model has served CTE well over the years. However, as the accountability for student achievement has become the focus, CTE must consider an evaluation system that will align with the CCR Model for KDE.

The SISI includes a framework for whole school reform and has served as the guiding model for KDE. Full implementation of the SISI required school leaders to possess instructional leadership traits. The Scholastic Audit was designed to measure instructional leadership through the implementation of the 9 Standards and 88 Indicators and was utilized to assist persistently failing schools in the academic setting. While the Scholastic Audit measured the fidelity of the SISI in the building, the process was invasive, disruptive to the educational culture, and expensive. School leaders who lacked instructional leadership traits struggled to implement the SISI. Due to these factors, the initiative was discontinued.

Sahin (2011) suggested that the lack of instructional leadership generally leads to a compromised school culture and, ultimately, poorly performing schools. Persistently failing schools led to the need for the Scholastic Audit. Bass (1999) suggested that successful principals possess an understanding of the traits of an effective instructional leader. These traits lead to student achievement and school improvement. According to Holliday (2012), instructional leadership is necessary in order to meet the accountability measures under the new education model in Kentucky. The evaluation system will require strong leadership and a commitment to whole school reform.
In an effort to design a model that incorporates teacher perceptions, Miller et al. (2014) developed the SISR to replace the Scholastic Audit as an evaluation process. The SISR is grouped into three categories: Academic Performance – Standards 1-3; Learning Environment – Standards 4-6; and Efficiency – Standards 7-9. The SISR incorporates 62 indicators and relies on teacher perceptions or reactions to the indicators for school improvement. The instrument considers the school leaders’ implementation of the standards and the effectiveness of the implementation.

The SISR has been piloted in the academic setting, and the results are positive. Modification of the SISR for CTE provides an inexpensive model to evaluate vocational programs across the state. The SISR can be conducted during a normal faculty meeting, requiring 30-45 minutes for completion. The SISR has the potential to replace the Program Assessment Evaluation Model for Career and Technical Education in the Kentucky Public Education System. Therefore, the purpose of the current study was to analyze the impact of a mediated model of leadership on student achievement, through its effect on instruction. The SISR was the primary instrument utilized to gather data (Miller et al., 2014).
CHAPTER II: REVIEW OF LITERATURE

The KDE continually seeks innovation for addressing school improvement and student achievement. As CTE in Kentucky moved under KDE in 2012, CCR initiatives have become a priority (Winkler, 2012). The OCTE currently utilizes the Program Assessment as an accountability model for the system. No external programs exist for assessing the extent to which instruction influences school improvement. While the Program Assessment incorporates components of the Standards and Indicators for School Improvement (SISI), no formal academic audit system was used in CTE facilities to inspect for implementation of the SISI or to evaluate instruction. Todd (2010) asserted that the SISI requires school leaders to move from the traditional management role in a building to a focus on leadership. While Todd’s research focused on the academic setting, it can be argued that this paradigm shift is needed in the CTE setting due to Career Readiness requirements.

The daily administrative duties of today’s school leader are only a portion of the position’s responsibilities. Principals are expected to manage the facility, motivate students and teachers, provide instructional leadership, and provide continuous improvement through professional development and growth opportunities. Quinn (2002) stressed that an effective principal is expected to serve as the instructional leader of the building who inspires teachers to impose their content expertise and applicable instructional practices into the culture of the building.

The current study brings together the issues that were enumerated in in Chapter I. Specifically, this research first addresses the Program Assessment process utilized to evaluate KY TECH centers and the fact that there are no external programs for assessing
the extent to which instruction influences school improvement. Second, the SISI instrument has not been formally used to expose growth areas for the OCTE or to evaluate CTE schools and programs in general. Third, leadership in the CTE school setting has not been evaluated for mediated effects on student achievement. The current study exposes the level of instructional leadership exhibited by principals, as perceived by CTE teachers, in the Kentucky public school system in their respective settings. Finally, the Standards and Indicators Scholastic Review (SISR) were utilized to evaluate the control factors of leadership, instruction, and accountability outcomes for the KY TECH school system, career centers, and local high school CTE programs.

Therefore, the purpose of this study analyzed the impact of a mediated model of leadership on student achievement through its effect on instruction. This chapter will review the history and literature related to this topic through the following sections: Career and Technical Education in Kentucky; School Improvement in CTE Schools; Standard and Indicators for School Improvement; and Leadership and Instruction in CTE Schools.

**Career and Technical Education in Kentucky**

CTE evolved nationally with the development of the industrial society. The Smith-Hughes Act (P.L. 64-347) of 1917 incorporated CTE as a program offering in the U.S. Department of Education. Each state was expected to offer CTE coursework as a condition of sustaining federal funding. Holliday (2012) explained that Kentucky maintains a focus on 16 career clusters that are incorporated into the curriculum. The purpose of CTE in Kentucky’s public schools is to provide skill sets necessary for a successful transition to a post-secondary institution or for a successful transition into the
workforce. Students enroll in a course sequence that guides their educational experience through a career pathway to develop skill sets necessary in a chosen career. Winkler (2012) asserted that the competency-based learning approach interposes academic knowledge, critical thinking skills, problem-solving skills, higher-ordering reasoning skills, and leadership behaviors which are characteristics of the 21st Century Learning Skills identified in KDE’s Unbridled Learning Model (KDE, 2009). Students interested in one of the 16 career pathways enroll in one of the following CTE school settings: KY TECH, locally controlled career centers, or comprehensive high school CTE programs.

**Types of CTE Schools**

KDE provides local school districts with the latitude to make decisions concerning the delivery of CTE. The method of distribution is inconsistent across the Commonwealth, and student achievement outcomes are equally as varied. Perry and Wallace (2012) suggested four types of schools in the CTE design: Career Academies, Technical Education Programs, the Early College Model, and a School-Based Enterprise. Career Academies were established in 1970 and were designed to serve approximately 200 students in the ninth and tenth grades. These academies are synonymous with career magnet schools or small learning communities. The second type of school is the Technical Education Program, which infuses the junior and senior years of high school and the freshman and sophomore years at a community college to earn a technical degree. The third type is the Early College Model, which is offered on a community college campus during the junior and senior years of high school and leads to a two-year degree upon graduation. Finally, the School-Based Enterprise is a model that incorporates the
identification of the specific needs of a community and provides service-learning projects associated with a particular community need (Perry & Wallace, 2012).

KDE incorporates multiple delivery systems for CTE. Traditionally, the Kentucky Workforce Development Cabinet was the primary provider of CTE for secondary and post-secondary students. The Kentucky Post-secondary Education Improvement Act of 1997 was the primary influence in the separation of secondary and post-secondary CTE in Kentucky. The Kentucky Community and Technical College System (KCTCS) merged the regional vocational schools and the community college system. KCTCS established guidelines to provide career and technical education programs and general education courses to post-secondary students on 16 KCTCS campuses across Kentucky. KY TECH was identified as the primary provider of Career and Technical Education on the secondary level in Kentucky’s public school system. KY TECH originally maintained 55 area campuses and was later reduced to 53 campuses. KY TECH continued the mission of providing secondary students with technical skill sets and career readiness. During this shift in governance, local districts expanded their CTE program offerings by embedding programs within their comprehensive middle and high schools and by building career centers under local school district control (Winkler, 2012).

For the purposes of this study, CTE will be analyzed in the three sectors of delivery: KY TECH School System, career centers within local school districts, and CTE programs embedded in the comprehensive high school.

**KY TECH.** The Kentucky legislature enacted House Bill 1 in 1998 placing KY TECH under the Kentucky Workforce Development Cabinet as the primary provider of CTE in Kentucky’s public school system. KY TECH offers technical programs through
16 Career Clusters. Technical programs are established based on local workforce needs of business and industry, school profile, local school district needs, and on recommendations from the technical school’s steering committee. KY TECH schools are designed to serve students from multiple school districts on 53 campuses across the Commonwealth. One KY TECH school may serve as many as 10 school districts.

Governor Breshear signed Senate Bill 1 in 2012, transitioning the OCTE from the Kentucky Workforce Development Cabinet to KDE. The move established an Associate Commissioner of the OCTE, whose office governs the KY TECH Branch as well as the local control career centers in the Next Generation Learner’s Branch. Winkler (2012) suggested that the merger created an overwhelming number of challenges: “Combining two branches is a daunting task and requires compromises by all parties. KY TECH employees are in the Kentucky state employee personnel system while career center employees are governed by a local school district personnel system, creating challenges” (p. 3).

Arnold (2013) noted that KY TECH teachers are required to have worked full time for a minimum of four years in the career field in which they are certified to teach. Two of the four years must have been completed in the last five years. Teachers are required to maintain personal National Industry Certification in the content area and their program. School leaders prefer a teaching degree from a university, although a four-year degree is not required for the vocational teaching certificate in Kentucky. Teachers must obtain a two-year vocational teaching degree at an accredited university in order to earn certification through the EPSB. New teachers are required to attend the weeklong KY TECH New Teacher Institute (NTI) during their first year of teaching. NTI serves as a
teaching “boot camp” that incorporates lesson plan development, classroom management strategies, test writing techniques, and curriculum development. KY TECH schools may offer up to 12 technical programs and serve up to seven different school districts. Secondary schools are provided with enrollment allotments based on the comprehensive high school student enrollment for Grades 9 through 12 and career pathways chosen by students (Arnold, 2013).

The CCR initiative by KDE has challenged the 53 KY TECH schools. The implementation of this initiative has forced the schools to incorporate Career Readiness initiatives into their curriculum. KY TECH schools are expected to maintain accountability through Program Assessment, while implementing a focus shift to the National Career Readiness Certificate earned through the ACT’s Work Keys Assessment, Kentucky Occupational Skill Standards Assessment (KOSSA), and Industry Certifications as they pertain to program areas (Holliday, 2012).

**Career centers.** Winkler (2012) asserted that OCTE offers KY TECH as a primary delivery system for CTE in the state. School districts transport students to KY TECH campuses to attend classes. School districts that felt transportation costs were excessive or desired governance over the center that offers CTE to their students petitioned to open career centers within their district. Arnold (2013) stated that the centers operate in the same manner as KY TECH under the governance of the hosting district. However, the center serves one district, offers the programs that meet the needs of the local school district, and partners with local business and industry to offer career pathways that satisfy the needs of the industrial sector. The teachers in the centers are employees of KDE local school district, meet the teacher certification requirements of the
Kentucky EPSB, and are enrolled in the local district personnel system. OCTE supports 47 career centers at this time.

**CTE programs in the comprehensive high school.** Under the framework of the CCR initiative and the tensions dividing the demands of the manufacturing community, technical schools are the most likely settings for placing 21st century skills in the hands of today’s youth. Perry and Wallace (2012) suggested that school-based career programs are most effective when offered in tandem with core content coursework. Federal legislation (e.g., Perkins I, II, III, & IV) has served as the guiding influence for CTE for almost a century and has mandated the blending of vocational and academic education in the public school setting.

The Smith-Hughes Act (P.L. 64-347) of 1917 recognized vocational education and provided funding for the public school system to prepare workers for factories, mills, and positions created as a result of the industrial revolution. CTE was designed as a career pathway that includes a sequence of courses and work-based learning experiences to prepare students for beginning employment opportunities (Gordon, 2014). The Smith-Hughes Act (P.L. 64-347) recognized CTE as an independent system of education, which was established with an individual board of education, funding, formal teacher preparation, and teaching certification. The legislation served as a driver in the division between academic instruction in a comprehensive high school and the real-world application of concepts taught in the vocational setting (Threeton, 2007). Perry and Wallace (2012) asserted that the rise of occupational and technical education did not exempt formal schools from their role of preparing youth. Vocational education and academic education were established as two separate career pathways in the public school
system. The vocational education track was associated with substandard training and ultimately fortified the division of the social classes in the comprehensive high school setting. The stigma continues today.

**Historical Perspective**

The Smith-Hughes Act (P.L. 64-347) of 1917 established vocational education as an official career pathway in the public education system. The reauthorization of the Smith-Hughes Act (P.L. 64-347) continued from the 1920s to the 1950s, establishing the importance of vocational education in the business and industry sector and in the public education system. The Vocational Education Act (P.L. 88-210) in 1963 shifted the sole focus of CTE from job preparation to include an economic and social component (Rojewski, 2002).

CTE adjusted its mission and vision to incorporate the federal directives. As the impact of CTE on student achievement and economic development became more evident, comprehensive high schools increased the role of CTE in their course offerings. Students who were enrolled in CTE programs sought the lab environment and the “hands-on” approach to learning. Traditionally, minimal time was spent in the classroom environment; CTE teachers taught the majority of their curriculum with real-world projects. This approach appealed to kinesthetic learners and significantly influenced the comprehensive high school behavior referral, attendance, and graduation rates. Legislators viewed it as an opportunity to increase student achievement by asking CTE teachers to incorporate academics into their daily instruction. The real-life application of academic standards in the CTE setting was felt to be the link to student achievement for vocational students. Rojewski (2002) suggested that the Carl D. Perkins Act of 1990
(P.L. 101-392) was an attempt to ensure that CTE programs emphasize academic standards within their curriculum. This new focus in policy was viewed as one of the “most significant policy shifts in the history of federal involvement in career and technical education. For the first time, emphasis was placed on academic, as well as occupational skills” (Threeton, 2007, p. 3), forcing a paradigm shift for CTE teachers.

The Carl D. Perkins Act III (P.L. 105-332) was reauthorized in 1998, expanding the original parameters. Academic and vocational proficiencies were identified as necessary standards, and the Perkins Act III (P.L. 105-332) focused on increasing academic achievement, while preparing youth to transition to an institution or into the workforce. Lynch (2000) suggested that the legislation supported the fulfillment of education, employment, or a military experience by providing higher order reasoning skills, critical thinking skills, and skill sets necessary for a chosen career. The renewed focus on academics forced CTE to generate initiatives to satisfy the federal guidelines, while maintaining the fidelity of the program standards.

The No Child Left Behind (NCLB) Act of 2001, recognized as one of the most significant pieces of legislation concerning educational reform introduced in decades, attempted to ensure that all students succeed. The NCLB was established on the framework of increased flexibility, defined accountability, substantial options for parents, and research-based teaching strategies that increase student achievement. Reese (2004) asserted that the act provided options for experienced teachers to explore their strengths. Teacher experience, professional development, and proficiency were factors in determining subject matter competency. Lambert (2002) suggested that teachers may serve as instructional leaders in a building. If the principal serves as the sole
instructional leader of a building, then leadership capacity in teachers would not be developed. The act of overlooking a talent pipeline within a school created internal challenges for meeting NCLB.

Bass and Bass (2008) argued that transformational leadership is necessary to empower teachers. The development of instructional leaders is essential to school improvement and student achievement. The NCLB raised accountability standards for secondary schools by providing a construct for elevating the importance of school improvement. A metric was designed to consider adequate yearly progress (AYP) for all schools, and the school report card was implemented to ensure transparency between and among school districts. Schools that do not meet AYP faced sanctions and potential reform. This transparency created a competitive environment and motivated school districts to perform. Winkler (2012) asserted that while the NCLB did not directly apply to CTE sectors, this movement pushed CTE to revisit competency alignment with business and industry, while implementing strategies to increase academic standards in the CTE setting. With the introduction of the Program Improvement Plan (PIP), School Improvement Plan (SIP), and District Improvement Plan (DIP), school improvement was established as a top priority for career and technical education in Kentucky.

**School Improvement in CTE Schools**

In a report produced for manufacturers, Bunch (2012) stated that CTE is directly linked to the recovery of the U.S. economy. In recent years, growth in the manufacturing sector has created a demand for a skilled labor force and has exposed weaknesses in the talent pipeline. Bunch suggested that the introduction of CTE as a critical contributor in the economic rebound and the development of a skilled workforce compelled the
Kentucky OCTE to reconsider their policies concerning school improvement and the procedures employed for the delivery of CTE in the public school system. The unrest in the manufacturing sector pressed legislators to reauthorize the Carl D. Perkins Vocational and Technical Education Act of 2006 (Perkins IV). This federal act required CTE to develop programs that systemically incorporate academics into the curriculum while increasing accountability.

Kotamraju (2011) found that manufacturers are interested in the internal accountability, or return on investment (ROI), regarding school improvement as it relates to the Perkins IV ACT. Kotamraju suggested that CTE is difficult to measure internally due to the lack of data and measurement, accountability and evaluation, and research. However, manufacturers value ROI and will contribute to the CTE system to solidify a talent pipeline that provides a globally competitive skilled workforce. Thus, the resurgence of the manufacturing sector demands in Kentucky is one of the contributing factors that has elevated the status of CTE and revealed areas for improvement.

Winkler (2012) suggested that the merger of CTE and KDE in 2012 created multiple opportunities for CTE to adopt new and innovative improvement models. The introduction of the Professional Growth and Effectiveness System (PGES) for teachers and principals was a step toward a systemic approach to instructional improvement. In 2013, Kentucky House Bill 1 incorporated an evaluation system for teachers and principals, while aligning the continuous improvement process with Kentucky’s Framework for Teaching. PGES was adopted as a pilot for 10 CTE schools during 2013-2014. The remainder of CTE schools would enter the pilot during 2014-2015, and all CTE schools will participate in the PGES model in 2015-2016 (Holliday, 2012). The
PGES movement exposed the difference between the Program Assessment accountability model and a teacher evaluation model.

Kotamraju and Mettille (2012) asserted that evaluation and accountability are considered tantamount by CTE officials. Accountability reflects whether a benchmark has been met, while evaluation measures the extent to which the benchmark was met. Although research is available on the issue of evaluation, very little research exists relative to CTE in Kentucky. Conversely, CTE programs are required to meet accountability standards for funding purposes; however, research is not conducted to measure outcomes for each program. The Program Assessment model was introduced by CTE to administer accountability; at the time of this writing, the evaluation piece has yet to be developed.

**Program Assessment in CTE**

According to Winkler (2012), the OCTE in Kentucky was charged in 2000 with developing an assessment process for CTE programs that served Kentucky’s public school system. The stakeholders agreed on a 21-standard instrument to be utilized for assessment. The system established a two-year cycle that provided opportunities for revisions during each cycle. While the document was initially introduced with 21 standards related to the SISI, it was later reduced to 17. The modification of the 2015-2017 Program Assessment evaluation cycle will include 12 standards. The assessment process involves the three school sectors in this study and includes 95 schools and 520 programs across the Commonwealth (KDE, 2014).

The Program Assessment team coordinates a site visit on each program to check the standards for documentation that supports each indicator. The program receives a
rating from 1 to 4 on a 4-point Likert scale providing teachers with insight and to guide the development of PIP. The overall school score guides the school’s CIP. The OCTE utilizes statewide scores to establish professional development opportunities for teachers. While the Program Assessment process determines the level of documentation provided by each program and school, it provides very little as an evaluative instrument.

**Effective CTE Principals**

The role of building principal has experienced a significant transformation in recent years. The management style of leadership that was once common practice in CTE is now obsolete as an individual approach. The building principal is required to fulfill multiple responsibilities and to implement a variety of leadership styles to realize school improvement. The principal as an instructional leader has a high priority in school improvement reform (Manasse, 1985). KDE established goals that support teachers in a high performing school (KDE, 2006b). Instructional leadership programs in Kentucky are required to adhere to the following:

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

The Effective Instructional Leadership Act (EILA) of 2005 delineated the act as 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 described in a training program manual 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)

Principals are expected to inspire students and teachers in a climate of high stakes accountability, manage and maintain facilities, and serve as the instructional leader by modeling behaviors they expect from teachers (Manasse, 1985). The Perkins III (P.L. 105-332) re-authorization in 1998 established a platform for fostering instructional leaders and provided funding for professional development for teachers and leaders to improve teaching strategies and instructional leadership. Quinn (2002) suggested that the principal must be a convincing instructional leader in order to effect school improvement. An instructional leader maintains a focus on personal growth and active teaching in order to reinforce student success, while providing professional development opportunities that support student centered initiatives. While academic principals have shifted their focus to instructional leadership over the past decade, only recently the educational reform forced CTE principals to consider a shift from the traditional management style of
leadership to a transformational style. Blase and Blase (2001) noted that a manager may control initiatives but a leader inspires collaboration, empowers teachers, and fosters a shared vision, which are characteristics identified by the EILA Act.

The traditional style of management that is utilized to accomplish a particular task has fallen out of favor in educational systems, as well as in the business world that supplies the talent pipeline for CTE. The distinction between management and leadership is crucial in leading today’s workforce. Bennis and Nanus (2007) contended that “managers are people who do things right and leaders do the right thing” (p. 20). They defined leadership as influence over individuals. Northouse (2012) stated that leadership is a process that requires influence, occurs in groups, and maintains common goals as a central focus. Northouse further indicated that “Leadership is a process whereby an individual influences a group of individuals to achieve a common goal” (p. 5). Effective leadership in the work environment can be directly linked to the conceptual model involving trust, respect, and essential skills.

Blase and Blase (1999) conducted a study with over 800 teachers. They developed an open-ended questionnaire, the Inventory of Strategies Used by Principals to Influence Classroom Teaching (ISUPICT), to garner information concerning the relationship among teachers, instructional leadership, and student achievement. The survey was distributed to 809 teachers and explored the characteristics of principals who had a positive influence on classroom instruction. Each teacher was limited to 500 words on the open-ended questions. The study revealed that effective principal-teacher relationships positively impact instruction in two areas: talking with teachers to promote
reflection and promoting professional growth. The following five talking strategies were identified by teachers to promote reflection:

1. Making suggestions
2. Giving feedback
3. Modeling
4. Using inquiry and soliciting advice and opinions
5. Giving praise

Principals used six strategies to promote professional growth:

1. Emphasizing the study of teaching and learning
2. Supporting collaboration efforts among educators
3. Developing coaching relationships among educators
4. Encouraging and supporting redesign
5. Applying the principles of adult learning, growth, and development to all phases of staff development
6. Implementing action research to inform instruction decision making (Blase and Blase, 1999)

Teachers reported the effect of these behaviors as having the following effects: motivation, satisfaction, self-esteem, efficacy, and sense of security. Teachers enhanced reflective behavior through encouragement, conferences, and collaboration. Blase and Blase (1999) suggested that effective principals support peer teacher observations, the redesign of instructional programs, and teaching strategies. The study revealed that teachers identified talking with teachers to promote reflection and promoting professional growth as critical for effective instructional leadership. Blase and Blase asserted, “The
data in this study indicate that each of the instructional leadership strategies described above have strong ‘enhancing effects’ on teachers emotionally, cognitively, and behaviorally” (p. 133).

**Behavioral Traits**

The current study utilized the SISR to determine the leadership traits that teachers identify as most important to student achievement and the leadership behaviors they feel are most often exhibited by their building principal. The SISR was distributed to CTE teachers in KY TECH, career centers, and comprehensive high school CTE programs. It is essential for CTE principals to understand the leadership traits associated with student achievement. While minimal research exists concerning leadership traits in CTE, Marzano, Waters, and McNulty (2005) suggested 21 leadership traits that are necessary for effective school leadership, which applies to leaders in both the academic and CTE setting alike.

Marzano et al. (2005) reviewed over 69 studies from 1970 through 2001 that involved over 2,800 schools, 14,000 teachers, and 1,400,000 students. The meta-analysis included teacher perceptions about principal leadership behaviors and revealed 21 behaviors that teachers feel are essential for student achievement. These 21 behaviors have been widely accepted by researchers in the field of educational leadership. These leadership behaviors and their respective correlation coefficients are listed in Table 2.
### Table 2

*List and Description of the Responsibilities of School Leaders in Order of Correlation with Student Academic Achievement*

<table>
<thead>
<tr>
<th>Responsibility</th>
<th>Correlation</th>
<th>The extent to which the principal . . .</th>
</tr>
</thead>
<tbody>
<tr>
<td>Situational awareness</td>
<td>0.33</td>
<td>Is aware of the details and undercurrents in the running of the school and uses this information to address current and potential problems</td>
</tr>
<tr>
<td>Flexibility</td>
<td>0.28</td>
<td>Adapts his or her leadership behavior to the needs of the current situation and is comfortable with dissent</td>
</tr>
<tr>
<td>Discipline</td>
<td>0.27</td>
<td>Protects teachers from issues and influences that would detract from their teaching time or focus</td>
</tr>
<tr>
<td>Monitoring/evaluating</td>
<td>0.27</td>
<td>Monitors the effectiveness of school practices and their impact on student learning</td>
</tr>
<tr>
<td>Outreach</td>
<td>0.27</td>
<td>Is an advocate and spokesperson for the school to all stakeholders</td>
</tr>
<tr>
<td>Change agent</td>
<td>0.25</td>
<td>Is willing to and actively challenges the status quo</td>
</tr>
<tr>
<td>Culture</td>
<td>0.25</td>
<td>Fosters shared beliefs and a sense of community and cooperation.</td>
</tr>
<tr>
<td>Input</td>
<td>0.25</td>
<td>Involves teachers in the design and implementation of important decisions and policies</td>
</tr>
<tr>
<td>Knowledge of curriculum, instruction, and assessment</td>
<td>0.25</td>
<td>Is knowledgeable about current curriculum, instruction, and assessment practices</td>
</tr>
<tr>
<td>Order</td>
<td>0.25</td>
<td>Establishes a set of standard operating procedures and routines</td>
</tr>
<tr>
<td>Resources</td>
<td>0.25</td>
<td>Provides teachers with the material and professional development necessary for the successful execution of their jobs</td>
</tr>
</tbody>
</table>
The leadership style of CTE principals varies due to personal experiences, background with business and industry, and the professional preparation program in which they participated. The level of effective instructional leadership in CTE also is varied. Further research is needed to determine preferred leadership styles and leadership traits associated with instructional leadership in CTE. Fleenor (2006) stated that the Trait Approach is one of the earliest models for leadership research. Traditionally, CTE

Table 2 (Continued)

<table>
<thead>
<tr>
<th>Responsibility/Leader Trait</th>
<th>Rating</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contingent rewards</td>
<td>0.24</td>
<td>Recognizes and rewards individual accomplishments</td>
</tr>
<tr>
<td>Focus</td>
<td>0.24</td>
<td>Establishes clear goals and keeps those goals in the forefront of the school’s attention</td>
</tr>
<tr>
<td>Intellectual stimulation</td>
<td>0.24</td>
<td>Ensures that faculty and staff are aware of the most current theories and practices and makes the discussion of these a regular aspect of the school’s culture</td>
</tr>
<tr>
<td>Communication</td>
<td>0.23</td>
<td>Establishes strong lines of communication with teachers and among students</td>
</tr>
<tr>
<td>Ideals/beliefs</td>
<td>0.22</td>
<td>Communicates and operates from strong ideals and beliefs about education</td>
</tr>
<tr>
<td>Involvement in curriculum, instruction, and assessment</td>
<td>0.20</td>
<td>Is directly involved in the design and implementation of curriculum, instruction, and assessment practices</td>
</tr>
<tr>
<td>Optimizer</td>
<td>0.20</td>
<td>Inspires and leads new and challenging innovations</td>
</tr>
<tr>
<td>Visibility</td>
<td>0.20</td>
<td>Has quality contact and interactions with teachers and students</td>
</tr>
<tr>
<td>Affirmation</td>
<td>0.19</td>
<td>Recognizes and celebrates school accomplishments and acknowledges failures</td>
</tr>
<tr>
<td>Relationships</td>
<td>0.18</td>
<td>Demonstrates an awareness of the personal aspects of teachers and staff</td>
</tr>
</tbody>
</table>

*NOTE*: Adapted from Marzano et al. (2005). Responsibilities of School Leaders.
training models have endorsed this approach as most effective. This theory supports the concept that leaders possess innate traits that consistently support behaviors regardless of the scenario. This approach distinguishes the differences between leaders and followers. Leaders tend to possess more of the following traits: height, intelligence, extraversion, adjustment, dominance, and self-confidence. In a study by House and Aditya (1997), six traits were identified that closely associate with effective leadership: integrity, intelligence, extraversion, conscientious, open to experience, and self-esteem. They argued that effective leadership is associated with the traits possessed by the individual, and these six are the most common. MacBeath (as cited in Lewis & Murphy, 2008,) identified trust as a critical aspect in six international studies concerning school leadership. MacBeath asserted that trust maintains a significantly different connotation when compared in the business sector and in the traditional professional arena. Internal trust is required for school leaders to build the confidence necessary for teachers to share their weaknesses and to expose the areas for growth.

Rammer (2007) examined the 21 behavior traits identified by Marzano et al. (2005) in a study of 200 superintendents in the Wisconsin school system. They were asked to identify to what extent each of the 21 traits was considered most important when interviewing principals. Mean scores were calculated, and 92% of the responses revealed that they either strongly agreed or agreed that Marzano’s et al. 21 behavior traits are important when appointing principals.

Rammer (2007) suggested that, while superintendents found the 21 behavior traits to be important, they did not specifically ask candidates about them. Superintendents acquired the information passively. They focused on job applications, references,
interviews, and personal information to reveal the traits that each possessed.

**Dispositional Characteristics.** One of the dispositional characteristics that is traditionally overlooked in the empirical leadership literature is affective dispositions. Lord and Maher (as cited in Chemers, Watson, & May, 2000) argued that leaders who exhibit confidence, self-esteem, self-efficacy, and optimism are more motivational and provoke positive perceptions of leadership capacity. Bennis and Nanus (1985) conducted a study of leadership effects on students enrolled in the Reserve Officer Training Corps (ROTC) at multiple Arizona and southern California colleges and universities. During a six-week summer leadership training program, students were graded on their leadership ability in performing daily tasks and as a leader of a squad of 8-10 cadets. The study included 25 cadets who had participated in the summer camp the previous year. They were asked a series of questions, including the Revised Janis-Field Self-Esteem Scale (1988), the Hope Scale (1991), the Scheier and Carver (1985) Life Orientation Test (LOT), and Seligman’s (1991) Attributional Style Questionnaire that measure positive and negative behaviors to determine dispositional behavior as cited in Bennis and Nanus (1985). Student Leadership Dimension scores and the LOT scores were positively and significantly correlated with the cadet leadership performance rating. The measure of self-esteem showed a positive correlation with leadership efficacy.

Chemers et al. (2000) believed that a primary behavior in effective leaders is the ability to exhibit a positive image of strong decisive leadership that creates the perception of confidence. These perceptions of efficacy lead to the activities, level of goals, and perseverance in achieving these goals. Bennis and Nanus (2007) affirmed that the Quick Environmental Scanning Technique (QUEST) is utilized by larger companies to identify
dispositional characteristics and to establish a mutual trust within the workforce. The QUEST process incorporates the characteristics that support trust, such as “integrity, mutual respect, reliability, competence, and vision” (p. 155).

One of the primary concerns for CTE principals is the level of preparation for instructional leadership. The recent instructional leadership push in CTE schools has created reactionary approaches to school improvement. The perception of principals is restrictive concerning their ability to effectively model instructional leadership initiatives. Bandura and Cervone (as cited in Chemers et al., 2000) noted,

Self-efficacy judgments are important because they influence not only what skills people perceive themselves to have, but also what they believe they can do with the skills they possess. Self-efficacy beliefs can affect attentional and thinking processes, eliciting either confidence with positive concomitants or debilitating self-doubt. (p. 269)

**Student Achievement in CTE**

Holliday (2012) identified 21st century learning skills and college and career readiness skills as critical achievement indicators for students in the Kentucky public school system. Viviano (2012) asserted that it is the responsibility of the building leader to provide professional development and the resources to prepare today’s youth for the demands of the 21st century. Viviano suggested that CTE principals should offer support and coaching for their teachers in order to provide the skill sets necessary for student achievement. The National Board of Professional Teaching Standards (2012) published 13 standards that CTE teachers should be able to accomplish in order to foster student achievement in the CTE setting:
I. Knowledge of students

   ○ CTE administrators are committed to advancing the learning and well-being of all of our students. They will encourage teachers to use learning style inventories to help teach students in a manner that they are accustomed to learning.

II. Knowledge of subject matter

   ○ Strong administrators make sure that CTE teachers command a core body of knowledge about their profession and about pedagogy and they draw upon this knowledge to design instruction, facilitate student learning, and assess student progress.

III. Learning environment

   ○ We, as supervisors, encourage teachers to effectively manage their classroom and laboratory environments in a way that fosters democratic values, risk taking and love of learning. This can be done through frequent walkthroughs and informal observations.

IV. Embracing diversity

   ○ Administrators encourage a teaching environment that reflects equal treatment, fairness, and respect for diversity is modeled and taught.

V. Advancing knowledge of CTE subject matter

   ○ In order to ensure a high percentage of students who receive proficient or better on the state standardized tests from the (Pennsylvania Department of Education: Standard Aligned Systems, 2012, p. 1) and the (National Occupational Competency Testing Institute, 2012, p. 1) assessments, CTE leadership makes sure teachers foster a learning environment rich in differentiated instruction, conceptual learning, experiential learning, performance based learning, and one which includes rigorous academic integration.

VI. Assessment

   ○ CTE teachers are prompted by leadership to use a variety of assessment strategies to meet the needs of all students. Supervisors check often for a variety of formative and summative evaluation of student work.

VII. Workplace readiness
○ CTE supervisors inspire teachers to promote citizenship and employability skills by using standardized instruction in personal and professional behavioral-designed curriculum and students are graded for such. The Professional Development Program (PDPs) student workbooks are a great resource for teaching such skills.

VIII. Managing and balancing multiple life roles

○ Leaders model for CTE teachers’ development in student’s self-awareness, character, leadership, and civic values and ethics, along with teaching socially acceptable behavior.

IX. Social development

○ As administrators develop in teachers confidence, character, self-confidence, leadership and sound personal, social, and civic values, supervisors look for teachers to pass these traits on to their students.

X. Reflective practice

○ We look to find and help develop in teachers the art of reflecting on their teaching, either with colleagues or with administration, and are always looking to analyze and evaluate their teaching practice.

XI. Collaborative partnerships

○ All CTE leaders require teachers to establish collaborative partnerships with local business and industry as well as post-secondary institutions to enrich learning opportunities for our students and to ease transition into the workplace and college.

XII. Contributions to the educational process

○ Leaders as role models should encourage all of our teachers to contribute at least locally to the education process by staying current with new teaching initiatives for advancement in their field and the field of pedagogy.

XIII. Family and community partnerships

○ Leaders inspire CTE teachers to sustain family contact to achieve common goals for their students. (National Board for Professional Teaching Standards website, n.d., p. 53).

Work Keys. The Work Keys Assessment was developed in the 1980s by ACT, Inc. in an effort to measure workplace skills. Winkler (2012) explained the exam was
later adopted in Kentucky as the National Career Readiness Certificate (NCRC) and is issued to students who meet benchmarks on the assessment. The instrument consists of three elements, job skill assessment, job analysis, and skill training. While the National Work Keys Assessment measures 12 separate topics, KDE has narrowed the focus to three areas: Applied Mathematics, Locating Information, and Reading for Information. The Applied Math section provides work-related problems that require mathematical analysis for solutions. The Locating Information component incorporates tables, charts, graphs, and floor plans in the questioning process. The Reading for Information section measures the examinee’s ability to comprehend bulletins, manuals, regulations, and work-related memos. The Work Keys Assessment scores are classified as bronze, silver, gold, and platinum. Students who earn Bronze are prepared for 35% of the jobs introduced in the job summary. Students who earn Silver are ready for 65% of the jobs, Gold students are prepared for 90%, and Platinum students are prepared for 100% of the jobs profiled in the summary report. Students must score Silver or higher to receive the NCRC and to satisfy the requirements of KDE Career Readiness Model.

The Kentucky Workforce Investment Board (KWIB) included the Work Keys Assessment as a component of their economic development plan and as part of the criteria for communities to earn “Work Ready Community” status. Winkler (2012) defined work ready communities as regions that host a highly skilled workforce, adequate infrastructure to support manufacturing facilities, and transportation systems to transfer product. Holliday (2012) asserted that the Work Keys is an additional effort to align the public education system with the needs of business and industry. KDE embedded the
Work Keys Assessment in the Career Readiness Model during the CTE restructure to address students seeking a career pathway. Table 3 explains KDE model for CCR.

Table 3

**KDE CCR Model - KDE College Ready, Career Ready, and College AND Career Bonus**

<table>
<thead>
<tr>
<th>College Ready</th>
<th>KDE Career Ready</th>
<th>Bonus: College AND Career: Must meet at least one room each area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Must meet benchmarks on one of following:</td>
<td>Must meet benchmarks for one requirement in Career Academic area and must meet one requirement in Career and Technical area.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>College Ready</th>
<th>Career Ready Academic</th>
<th>Career Ready Technical</th>
<th>College Ready Academic</th>
<th>Career Ready Technical</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT Or Compass Or KYOTE</td>
<td>Armed Services Vocational Aptitude Battery (ASVAB) Or ACT Work Keys (Reading for Information, Applied Math, Locating Information)</td>
<td>KOSSA Or Industry Certificates</td>
<td>ACT OR Compass OR KYOTE</td>
<td>KOSSA OR Industry Certificates</td>
</tr>
</tbody>
</table>

Note: By meeting the college ready definition, the student does not have to take the additional tests of ASVAB or Work Keys for the bonus area. (2) For accountability purposes, scores are capped at 100.

Note: Adapted from the Kentucky Department of Education College and Career Readiness Model (2012).
Kentucky Occupational Skills Standard Assessment (KOSSA). Winkler (2012) stated that the KOSSA is a “tool to assess technical skill attainment required under Perkins legislation” (p. 2). The instrument was developed in 1998 and incorporated standards based on input from business and industry. The KOSSA was implemented in 2000 and is distributed to all CTE students who have completed two technical credits and are enrolled in a third credit. If a student meets the criteria earlier than the senior year and is assessed, the score is not considered for the career readiness accountability measure until the senior year. The standards were developed into three broad categories: academic, employability, and occupational. The CTE curriculum was aligned to these standards, and, ultimately, the KOSSA is used to measure how effectively the standards are incorporated into each CTE program. According to Winkler, the KOSSA is a critical piece in the Career Readiness Model for KDE. The KOSSA is an option in the technical component of the model and measures student proficiency in a particular career pathway.

National Industry Certifications. KDE’s Career Readiness Model provides a secondary option—National Industry Certification—as a component of the technical requirements. Students may earn an industry certification by completing career-related work experience, successfully completing a competency-based test, and by meeting benchmarks on the written exam in the technical content area. Holliday (2012) suggested that KDE incorporate the industry certifications as a component of the Career Readiness Model for each of the 16 Career Clusters. In addition to the NCRC, the KWIB recommended National Industry Certifications in each CTE program area to satisfy the employment qualifications for business and industry in Kentucky. Students who earn an industry certification are “fast tracked” in the hiring pool and given priority consideration.
during the hiring process. While the Kentucky OCTE is working to offer an industry certification in each career cluster, Winkler (2013) asserted that the industry certifications will be approved for the Career Readiness component of KDE model and for the federal Perkins Accountability model when the following criteria are met: recognized and required by industry, recommended by national or state industries, aligned with curriculum and national standards, and designed to be administered after a sequence of courses within a career pathway.

While KDE has generated an exhaustive list of approved industry certifications that provide multiple options across the state, the majority of programs have selected primary industry certifications that are attempted by students in their particular technical area. Automotive Technology maintains a focus on Automotive Service Excellence (ASE) through the National Automotive Technicians Education Foundation; Welding Technology programs review students through the American Welding Society (AWS); Computerized Measuring and Machining utilize National Industry for Manufacturing (NIMS); and Business Education teachers assess students with the IC3 in an effort to earn Microsoft Plus certification. CTE teachers seek the certifications that are recognized by their local business and industry partners. CTE students who have completed two credits and have enrolled in a third credit of a particular technical core are considered preparatory students. KDE mandates that all CTE preparatory students participate in the Work Keys and KOSSA assessments. In addition, preparatory students completing a course sequence are encouraged to test for an industry certification when funding is available. When students meet benchmarks in Work Keys and KOSSA or National Industry Certification, they are considered career ready.
Standards and Indicators for School Improvement

The SISI document was developed as a framework to support standards-based, whole school reform. This movement was unique to Kentucky, as most states focused on standards-based content reform. Kentucky was the first to move to whole school reform. The SISI was developed as an instrument to measure school performance, and it contains 9 Standards and 88 Indicators to support achievement for individual students (KDE, 2004d). The 9 Standards are organized into three areas: (a) Academic Performance, (b) Learning Environment, and (c) Organizational Efficiency.

The SISI provided the cornerstone for whole school reform in Kentucky and forced principals to focus on instructional leadership, instructional strategies, and professional development to support high academic student achievement. McKinney (2007) argued that the shift in leadership style was necessary for schools to realize student success. The shift from the traditional management style of leadership to instructional leadership was met with opposition in some areas due to resistance to change. The SISI was introduced as a critical component of an educational reform movement that exposed the need for instructional leadership in all schools. The paradigm shift required extensive professional development for teachers and administrators (Ennis, 2007). The high stakes accountability model encouraged building leaders to track academic success and student growth and to implement strategies to correct delayed progress in student outcomes (Murphy, 2004). The assumption has been made that the cumulative effect of the 9 Standards and 88 Indicators produces high student academic achievement and whole school improvement.

Principals are accountable for addressing the 9 Standards of the SISI, maintaining
the ISSLC Standards, achieving NCLB expectations, and following policy mandates in an effort to achieve positive student outcomes and to realize school improvement. While Kentucky principals must be aware of the standards necessary for school improvement, leaders require data to support the selection of strategies that provide the greatest return on investment in their building. Research concerning the SISI and school improvement is deficient (Ennis, 2007). However, recent studies utilizing the SISI indicate that leadership has a significant impact on student achievement (Ennis, 2007; McKinney, 2007; Murphy, 2004; Todd, 2010). Support of the 9 Standards in the SISI document is necessary for school improvement. However, emphasis on individual standards that align with school improvement goals may be beneficial based on the needs of an individual school.

The introduction of the 9 Standards of the SISI in 1999 pressed Kentucky’s public education system to maintain a perpetual state of continuous improvement. According to Winkler (2012), the KY OCTE and KY TECH systems adopted the AdvancED Standards as a guiding model. OCTE and KY TECH modified pieces of the SISI standards for the Program Assessment instrument but did not adopt the SISI standards as a model for whole school reform. Hence, this study utilized the SISR to determine the degree to which Standard 3 (Instruction) mediate the effect of Standard 7 (Leadership) on student achievement in the CTE setting.

**The Nine Standards**

The 9 Standards of the SISI document encompass the guiding framework for the reform movement in Kentucky’s educational system. Each standard hosts corresponding research-based Indicators that support the existence of the standard. For more direct
analysis, the standards are divided into three areas: (a) Academic Performance, Standards 1-3; (b) Learning Environment, Standards 4-6; and (c) Efficiency, Standards 7-9 (KDE, 2003). Miller (as cited in Todd, 2010) suggested, “Understanding the extent to which these three components affect school success would represent a significant step in interpreting instructional leadership effectiveness, particularly under the auspices of the value-added assumptions being tested” (p. 20).

The SISI pushed Kentucky’s public education system into a state of continuous improvement. To date, multiple studies are available on the elementary and high school level concerning the SISI document. However, a review of the literature yields no research regarding the SISI document in the CTE setting. The current study analyzed the mediated effect of Standard 7 (Leadership) on Standard 3 (Instruction) as it pertains to student achievement in the CTE setting. These standards are selected from the 9 Standards found in the SISI document as follows:

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

**Standard 2:** The school utilizes multiple evaluation and assessment strategies to continuously monitor and modify instruction to meet student needs and support proficient student work.

**Standard 3:** The school’s instructional program actively engages all students by using effective, varied, and research-based practices to improve student academic performance.
Standard 4: The school/district functions as an effective learning community and supports a climate conductive to performance excellence.

Standard 5: 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: 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.

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.

Standard 8: There is evidence that the school is organized to maximize use of all available resources to support high student and staff performance.

Standard 9: 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. (KDE, 2008, p. 3)
**Academic performance.** The first three standards of the SISI are identified as the Academic Performance area. These standards are utilized to measure the schools' performance levels as they pertain to curriculum, instruction, and evaluation and assessment. The relationship among these standards is the locus of school improvement for most schools in the academic setting. However, the movement toward CCR-motivated leadership in the KY OCTE to consider these standards in the assessment process for the CTE setting. The current study incorporated parts of McKinney (2007) and Todd (2010) in the CTE setting utilizing Miller’s et al. (2013) SISR survey for evaluation.

McKinney (2007) studied the effects of Standard 1 (Curriculum) and Standard 3 (Instruction), as mediated by Standard 7 (Leadership), on the elementary level. The research is related to this study as it pertains to curriculum and instruction. McKinney asserted that the duties of the principal are central to curriculum and instruction. The study revealed that the relationship between Leadership and Instruction is significant. However, the relationship between Leadership and Curriculum was not significant when controlled for demographics. While the three standards are considered to be critical to student achievement and school improvement on the elementary level, Curriculum did not have a significant impact on student achievement. In an effort to expand the research, Todd (2010) conducted a similar study on the secondary level.

Todd (2010) examined the effects of Standard 1 (Curriculum) and Standard 3 (Instruction), as mediated by Standard 7 (Leadership), on the high school level. Todd suggested that research is deficient concerning the mediated effect of instructional leadership on curriculum and instruction on the high school level, although KDE
identified the principal as the primary instructional leader (KDE, 2006b). While this policy applied to all principals in Kentucky’s public education system, principals in CTE were under the governance of the KY Workforce Development Cabinet and were not required to adhere to the regulation, which created an even larger division between CTE and the academic arena.

Todd’s (2010) study established foundational research on the high school level that may be applied to the CTE system. Todd found that Leadership (Standard 7) had a significant impact on Instruction (Standard 3), as compared through the academic index. However, Leadership (Standard 7) had very little impact on Curriculum (Standard 1), when compared utilizing the academic index. The findings revealed that Leadership has a significant impact on Instruction in the elementary and high school levels, while leaders have minimal impact on Curriculum. While Standards 1 through 3 are presumed to be critical to student success, Standards 4 through 6 measure the learning environment and are considered essential for school improvement.

**Learning environment.** Standards 4 through 6 have been identified as the learning environment due to the focus on school culture and climate. The school is expected to function as a learning community that supports a climate of excellence. The school is expected to be organized as a family that removes barriers to learning in an effort to support the needs of the individual student. Standard 6 (Professional Development) encourages a climate of continuous learning through professional development opportunities for faculty and staff. The focus is a continuous state of reflection to determine areas for growth, improved teaching, and student learning. Ennis (2007) stated that Standard 6 (Professional Development) has a significant impact on
student outcomes: “Principals are identified as the instructional leader whose ability to facilitate a vision of high student performance is essential for success in Kentucky schools. Professional development is identified as the vehicle to improve teaching and learning” (p. 20).

Sahin (2011) noted that school culture has a direct influence on academic achievement and school improvement. KDE identified School Culture as a critical SISI standard when measuring teacher impact on learning. Shutt (as cited in Saravia, 2007) suggested that school culture is a statistically significant indicator of performance in Kentucky’s elementary schools. Shutt revealed a direct correlation between a positive school culture and student achievement; schools with a toxic culture experienced lower levels of achievement. Saravia (2007) determined that schools that implemented parent involvement programs enjoyed much higher levels of academic achievement.

Saravia (2007) focused on Standard 4 (School Culture) and Standard 5 (Student, Family, and Community Support), as measured by the Commonwealth Accountability Testing System (CATS) school accountability index. Demographic factors were compared to determine correlations, and the findings were exciting. The two standards, School Culture and Family and Community Support, had a significant impact on CATS academic index. The study revealed an 11% increase when controlling for demographic factors, with an effect size of .727. The results demonstrated that school culture and family and community support have a significant impact on student achievement on the elementary school level.

Efficiency. The efficiency section contains the final three standards that are designed to ensure that instructional decisions maintain high performance standards with
a focus on teaching and learning. The standards measure the school’s ability to create a learning culture that develops leadership capacity. This section also measures the effective use of school resources to support staff and student performance. The last standard of this section analyzed the school’s ability to develop, implement, and evaluate the school’s continuous improvement plan. The ability of a school to achieve these standards reflected the multiple leadership styles necessary to accomplish the goal for an individual situation.

Hersey, Blanchard, and Natemeyer (1979) defined leadership as the “process of influencing the activities of an individual or a group in efforts toward goal achievement in a given situation” (p. 83). In addition, they identified leader, follower, and situational variables as critical components of leadership. Pearman (as cited in Todd, 2010) indicated that “Leadership is in flux today, and the old paradigms for managing effectively are no longer enough. The key to success for millennium leaders is the ability to communicate meaningful information and build relationships among organizational members” (p. 26).

The development of leadership capacity is essential in order to achieve the standards in the Efficiency section and is often associated with transformational leadership. Howard (2005) conducted a study for leaders who were uncertain of their individual leadership style. Five questions were posed: (a) What is leadership? (b) What is your preferred leadership style? (c) How does our style impact the people you are leading? (d) What is the preferred leadership style of the members of your team? (e) What tasks are best assigned to team members based upon their preferred leadership style? Howard’s study of over 100 schools revealed four common characteristics: (a) they provide direction and meaning to the individuals they lead; (b) they generate trust; (c) they prefer action and
risk taking; and (d) they are communicators of hope. The research acknowledged that leaders may develop perceptions or attitudes, process stimuli, and make decisions based on their experiences and environment. Howard added that leadership styles may be learned. The research suggests that, without an accountability index, the efficiency standards may be left to the building leader’s interpretation. Howard revealed that strategic planning for leadership development might be determined through student outcomes.

Hallinger and Heck (1998) suggested that the school leadership construct is persistently developing, requiring researchers to engage a moving target. Kentucky schools require leadership that can make adjustments to meet the needs of students in an ever-changing culture to satisfy state accountability measures. In addition to the demands of instructional leadership, CTE principals are required to maintain the pulse of business and industry to ensure that students are not only career ready based on the Kentucky’s accountability model, but are perceived as career ready by the companies that will eventually employ them.

**The Scholastic Audit**

Kentucky’s SISI provided the framework for whole school, standards-based reform (KDE, 2003). The Scholastic Audit served an important role in evaluating the implementation of the SISI at individual schools. Petrosko and Rothstein (as cited in McKinney, 2007) asserted that the CATS was utilized to measure school-level performance through an overall accountability index. The SISI provided the framework for measuring each school and ranked schools by performance level. The CATS organized schools into three classifications: (a) meeting goal, (b) progressing, or (c) needing assistance. The schools in the latter category were organized by upper, middle,
and lower. The upper level (Level 1) received an Internal Review, the middle level (Level 2) received a Scholastic Review, and the lower level (Level 3) was required to participate in a Scholastic Audit (Ennis, 2007).

According to Miller, Houchens, Smith, Chon, and Hunt, (2014), the Scholastic Audit was a pivotal component in the SISI: Kentucky’s Model for Whole School Improvement. KDE introduced the Scholastic Audit as a process to evaluate the implementation of the SISI. The audit identified the 88 Indicators on a 4-point scale, and the team evaluated Level 3 schools utilizing behavioral anchors established from the standards. The audit team was composed of a parent, a teacher, a school administrator, a district administrator, a university faculty member, and a highly skilled educator (KDE, 2003).

The audits were established to analyze three areas of the SISI in the school setting: Academic Performance, Learning Environment, and Efficiency. Miller et al. (2014) indicated that the audit was validated for its effectiveness in establishing strengths of the school. While the audits provided rich data and critical feedback for school improvement, they were viewed as expensive, invasive, and disruptive to the educational process, and eventually they were eliminated as a component of the whole school reform approach. Miller et al. (2014) developed the Standards and Indicators Scholastic Review (SISR) survey to replace the Scholastic Audit. While the Scholastic Audit was never utilized in the CTE setting, the current study helped test the SISR as a viable replacement for measuring standards-based whole school reform in CTE schools.

**The Standards and Indicators for Scholastic Review (SISR).** Miller et al. (2014) asserted, “The SISR was designed as an inexpensive, quick, noninvasive set of
teacher perceptual scales” (p. 2). Teachers are encouraged to participate in the SISR during a faculty meeting. The survey requires an administration time of 45 minutes and includes teachers’ priorities for the 9 Standards, level of implementation for the 63 Indicators, and a brief demographics section. The SISR was distributed in two pilots. The first included eight schools; the results were very promising and suggested the instrument could successfully replace the Audit. Miller et al. (2014) reported, “The SISR has correlations with total achievement scores that are more than twice as strong as the original Scholastic Audit” (p. 3). The second pilot was distributed to 30 schools ranging from elementary to high school. While the second pilot upheld the findings in the first pilot results suggested that modifications to the survey would improve the transparency of each standard. The complete document of 9 Standards and corresponding Indicators can be found in Appendix B. The research team modified the 9 Standards of the SISR and they are as follows:

**Academic Performance (Standards 1-3)**

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

**Standard 2 (Classroom and School Evaluation/Student Assessment).** The school/teachers utilize high quality classroom evaluation/student assessment strategies to monitor and modify instruction on an ongoing basis to meet student needs and maximize student growth.

**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.
Learning Environment (Standards 4-6)

Standard 4 (School Learning Climate/Culture). The school functions as an effective learning community, reflecting high standards and high expectations for achievement and other outcomes across all student groups.

Standards 4A (Respectful, Orderly Environment that Prioritizes Learning). The school reflects a safe, orderly environment in which students, faculty, and staff are respected as individuals and student learning outcomes are a collective priority.

Standard 4B (Teacher Expectations and Beliefs about Student Learning). Teachers believe that all students can learn at effective levels, have high expectations across all student subgroups, and hold students accountable for learning outcomes.

Standard 5 (Student, Family, and Community Support). The school/district works with families and community groups to involve them in the life of the school and remove barriers to learning in an effort to meet the intellectual, social, career, and developmental needs of students.

Standard 6 (Teacher Improvement). The school identifies teacher growth needs based on an analysis of student achievement patterns, provides high-quality professional development opportunities for staff, and implements a performance evaluation system that improves teaching and learning.

Standard 6A (Professional Development). The school/district provides research-based, collaboratively-developed, results-driven professional development opportunities for teachers/staff in order to improve teaching and learning.

Standard 6B (Professional Growth and Evaluation). The principal/leadership team provides an effective performance evaluation system that is focused on helping
teachers improve the quality of their instruction in order to improve teaching and learning.

**Efficiency (Standards 7-9)**

**Standard 7 (Leadership).** The principal/leadership team provides constructive, effective guidance that is collaboratively developed and respectful of all stakeholders, while holding all individuals and groups accountable for their part in the collective focus on teaching, learning, and school improvement.

**Standard 8 (Organizational Structure and Resource Allocation Focused on School Improvement).** The school is organized to maximize the effective use of all available resources so that students and staff can achieve at high levels.

**Standard 9 (Strategic Planning).** Strategic planning for the school/district involves leadership, faculty, staff, and parents/community in the development of a comprehensive long-term framework that communicates clear purpose, direction, and action strategies focused on teaching and learning. (Miller et al., 2014)

**Leadership and Instruction in CTE Schools**

CTE teachers are required to complete a two-year degree in vocational education to earn certification through the Kentucky EPSB. Arnold (2013) explained that KY TECH traditionally hired principals from a pool of CTE teachers who had completed the Bachelor of Science Degree and had earned Kentucky Administration Certification through an approved graduate program offered to academic and vocational teachers. Arnold reported that KY TECH school leaders were required to complete three years of teaching experience in a CTE program and 15 graduate hours in vocational education administration to earn the Vocational Principal Certificate through the EPSB until the late
1990s. EPSB later changed the requirement to three years of CTE experience and the Master of Science Degree. The merger of KDE and the OCTE in 2012 lifted that requirement. CTE school leadership may have academic or vocational teaching experience and they may possess vocational administration certification or K-12 administration certification through EPSB. This progression established instructional leadership as paramount to school improvement, rather than a leader’s teaching orientation.

Principals in the KY TECH system were expected to lead all teachers through the quality assurance process to ensure Southern Association for Colleges and Schools (SACS) standards were met and documented. SACS later changed their name to AdvancED and adopted new standards. The primary standards are listed below. A full list of standards and indicators is located in Appendix C.

**AdvancED Standards for Quality Schools**

**Standard 1: Purpose and Direction**

The school maintains and communicates a purpose and direction that commit to high expectations for learning as well as shared values and beliefs about teaching and learning.

**Standard 2: Governance and Leadership**

The school operates under governance and leadership that promote and support student performance and school effectiveness.

**Standard 3: Teaching and Assessing for Learning**

The school’s curriculum, instructional design, and assessment practices guide and ensure teacher effectiveness and student learning.
**Standard 4: Resources and Support Systems**

The school has resources and provides services that support its purpose and direction to ensure success for all students.

**Standard 5: Using Results for Continuous Improvement**

The school implements a comprehensive assessment system that generates a range of data about student learning and school effectiveness and uses the results to guide.

KY TECH principals are expected to support the AdvancED Standards and require teachers to participate in annual professional development activities that support Program Assessment. Teachers who do not make adequate progress on the Standards may be reprimanded for not fulfilling their duties. A score of 3 or higher on the 4-point scale is considered acceptable in the system. Any score below a 2.5 may result in an improvement plan for the program.

AdvancED Standards guided the school accreditation process and were required to maintain certification. This documentation process provided evidence that the standards were being fulfilled. The SISI document provided an assessment tool to measure student outcomes and to assess school improvement. While the CTE system focused on documentation to satisfy AdvancED Standards, the SISI standards to measure student achievement and school improvement were disregarded.

**Leadership Framework.** The SISI document is the guiding framework for improving instruction and schools in Kentucky. Most school districts have conducted internal audits utilizing the SISI or reviews under the auspices of school improvement. KY TECH utilizes the Program Assessment under the governance of AdvancED
Standards for internal audits. KY TECH centers and CTE programs in career centers are audited through the Program Assessment process under AdvancED Standards, while CTE programs in the comprehensive high schools are audited through SISI.

KY TECH endorsed the SACS Standards and implemented initiatives to sustain the standards required for accreditation. According to Winkler (2012), KY TECH was the first CTE system in the nation to achieve SACS accreditation as a “school district,” thus requiring the same audit process for all schools. Winkler confirmed that the accomplishment was due to a stringent assessment process adopted as Program Assessment and consistency among schools. CTE schools in the KY TECH system and local district career centers were required to participate in the audit. While KY TECH has aligned their audit system and certification process, not all CTE programs are evaluated equally, which creates discrepancies among teachers, programs, and schools. The discrepancies are more prominent when comparing instruction, assessment, and instructional leadership behaviors in the CTE setting.

**Empirical Evidence.** Minimal research appears to be available in the area of leadership in CTE in Kentucky. However, the demand for instructional leadership has forced the Kentucky OCTE to revisit research that supports instructional leadership, student achievement, leadership traits, school culture, and the impact on school improvement.

The Kentucky Education Reform Act of 1990 led to the development of the SISI, which introduced instructional leadership as a critical component for school improvement. Costellow (2011) compared teacher perceptions of the leadership traits and transformational leadership traits that principals felt they exhibited on a daily basis.
Sahin (2011) theorized that strong instructional leadership has a significant impact on school culture and student achievement. The literature also revealed similar leadership traits that impacted student achievement and school culture, as identified in Costellow’s study. The reports support the need for further research in instructional leadership as it relates to CTE. This broader literature is significant to this study, as it provides the platform to encourage research in the field of career and technical education, leadership traits, and teacher preparation programs that support instructional leadership.

Instructional leadership is an integral part of the educational system due to the correlations among school culture, teaching strategies, student achievement, and the learning process. The leadership paradigm varies based on the leadership traits that are expressed by the building principal. Building principals rely on experiences, opportunities to exercise and grow leadership abilities through contextual situations, and formal leadership training programs to enhance their leadership skills. According to Blase and Blase (2000), reflective feedback for growth and improvement and continued professional development are two emerging themes in effective instructional leadership, as identified by teachers.

Within the broader context of leadership, a review of the literature was conducted on leadership focused on CTE through the Western Kentucky University library and Internet resource. One study within the broader context of leadership involved research performed by Costellow (2011) that addressed teacher perceptions and preferences in leadership. The research included the perceptions of academic teachers in Kentucky who work in the Green River Regional Educational Cooperative (GRREC) region. The study focused on the preferred leadership traits by gender, years of service, and preferred
leadership style. A second study was conducted in Izmir, Turkey. Sahin (2011) examined the impact of an instructional leader on a positive school culture, exposing a direct correlation for the principal as an instructional leader with a positive school culture.

Costellow (2011) examined instructional leadership and teacher preferences in a Kentucky school building. The purpose of the study was to explore teacher preferences based on gender, leadership traits, and leadership behaviors within the scope of the research. In order to determine the preferences of academic teachers in the public school system within the GRREC region, the following research questions were posed:

1. What gender preferences of building-level leaders exist among teachers?
   a. Do male teachers prefer male or female leadership?
   b. Do female teachers prefer male or female leadership?

2. What is the relationship between teachers’ gender and their preferred responsibilities of a school leader?
   a. Which responsibilities are most preferred by male teachers?
   b. Which responsibilities are most preferred by female teachers?

3. What is the relationship between teachers’ gender and their preferred leadership style?
   a. Do male teachers prefer a transactional or transformational leadership style?
   b. Do female teachers prefer a transactional or transformational leadership style?
4. Which of the 21 leadership responsibilities do principals feel are most important?

5. Which transactional or transformational leadership behaviors do principals most often exhibit? (Costellow, 2011, p. 72)

The methods for this research were limited to descriptive and comparative research designs, including survey data. Costellow realized that instructional leaders need to be aware of the leadership traits and behaviors preferred by their teachers. The quantitative survey instrument focused on public K-12 classroom teacher preferences for school administrators regarding gender, leadership traits, and transformational versus transactional leadership styles. A second survey was developed for principals, which elicited K-12 public education principal perceptions concerning the leadership traits most important to student achievement and positive culture. The survey also determined the transformational or transactional behaviors that were demonstrated more frequently. Specifically, Costellow’s survey was constructed for teachers and administrators and was distributed to a cluster sample of K-12 public school teachers and principals within the GRREC region, which is composed of 37 districts. The study included 7,299 public school K-12 teachers in 32 districts. All teachers were mailed surveys for the investigation. The cluster sample represented 16.6% of the 44,088 K-12 public school teachers in Kentucky. The research included 347 public school K-12 principals. The principal survey was divided into three sections: demographics, leadership traits, and leadership style. The leadership traits section incorporated the 21 leadership responsibilities identified by Marzano et al. (2005). The study required that teachers rate
the 21 traits on a 4-point Likert scale as not important, slightly important, important, or very important.

The survey results included participation by 2,802 (16.6%) teachers and 127 (28.5%) principals. The demographics revealed that over 82% of participants were female, 48% were elementary teachers, and 48% were middle or high school teachers. The study showed that male and female teachers identified the same nine leadership traits as most important and revealed that teachers had no preference regarding male or female leadership in the relationship category. Costellow included a comparison between genders and each of the 21 leadership traits, including transformational and transactional traits. The results included a significant difference in all areas except relationships. While the findings were not significant, the overall majority of participants preferred transformational to transactional leadership. However, the analysis of the transactional behaviors revealed that *Clear boundaries, procedures, and duties for all personnel* \( (M = 3.40) \) was the preferred trait. Two transformational behaviors were revealed: *Leadership works with staff to find answers for failure to meet goals, expectations, standards, levels of performance* \( (M = 3.39) \) and *Active, participatory leadership* \( (M = 3.29) \). These were rated second and third in teacher preferences. Teachers identified communication as the most important leadership trait, followed by discipline, culture, and order. They ranked visibility, culture, focus, and discipline as important but secondary to communication. Principals rated the leadership traits on a 4-point scale as follows: Communication, 3.92; Visibility, 3.86; Culture, 3.85; Focus, 3.74; Discipline, 3.73; Situational Awareness, 3.71; Monitoring/Evaluating, 3.69;
Affirmation, 3.68; Knowledge of Curriculum, Instruction, and Assessment, 3.63; and Relationships, 3.63.

One of the limitations of Costellow’s (2011) study was that the principals’ perceptions may have played a role in their self-analysis of transformational and transactional leadership behaviors. Their preparation program for leadership may have influenced desired outcomes. Another limitation was the limited number of teachers who possessed principal certification and understood the expected response to the survey. In addition, their leadership experience was not clearly defined, and data were not analyzed to determine whether that variable impacted the outcomes of the study. A third limitation included the “other” category in the column of elementary, middle, high, or other. The “other” category may have referred to alternative schools, vocational schools, or career centers. The instrument did not define the category; therefore, the results are unclear. This is a limitation due to the significance of some of the responses in the “other” category. Finally, the low response rate of 16.6% of teachers and 28.5% of principals was an additional limitation for the study.

Sahin (2011) investigated leadership traits and teacher preferences in building principals. The purpose of the study was to determine the relationship between instructional leadership style and school culture. The research focused on teacher perceptions concerning the style of instructional leadership and its impact on a positive school culture. In an effort to determine the relationship, the emphasis was placed on the following research questions:

1. How do teachers perceive the instructional leadership and the school culture in Curriculum Laboratory Schools (CLS)?
2. Do demographic descriptors influence teacher’s perceptions of the instructional leadership and the school culture?

3. Is there a relationship between the instructional leadership and the school culture?

4. Does instructional leadership explain school culture? (Sahin, 2011, p. 1922)

Sahin’s study utilized methods to include a quantitative design and survey instruments to determine perceptions regarding instructional leadership. Demographic descriptors, instructional leadership items, and components of school culture were utilized for the survey, which was distributed to 16 CLS in Izmir, Turkey. The stratified sampling design was applied to garner a sample of students ($N = 157$) based on student achievement and socioeconomic status. The Instructional Leadership Inventory questionnaire incorporated the 5-point Likert scale (1 = strongly agree to 5 = strongly disagree). Sahin later implemented a second survey and conducted personal interviews with teachers. This effort was designed to gather data that isolated the school culture. The survey incorporated the 5-point Likert scale (ranging from 1 = strongly agree to 5 = strongly disagree).

The results of the survey revealed that teachers had positive perceptions regarding the instructional leadership styles of their principals. Most areas were viewed as highly positive, and the school culture in their buildings was perceived as positive overall. The analysis exposed a positive and strong relationship between the instructional leadership style of the building principal and a positive school culture. Sahin found relatively high scores for this study: promotes professional development at 3.64, provides feedback on the teaching and learning process at 3.57, and instructional leadership by principal at
Monitoring and providing feedback were perceived at a more moderate level of 3.39. Teachers perceived the overall culture of the school as positive, with a score of 3.79. In the construct of school culture, the study exposed that “school leadership was most significantly influenced by instructional leadership” (Sahin, 2011, p. 1923). Teacher’s age and length of service had little significance on the outcome of the survey, and the conclusion was made that a positive relationship existed between instructional leadership and all levels of school culture. A shared vision and mission that includes instructional leadership will have a positive impact on school culture. Finally, the school leader is the deciding factor in a positive school culture.

The limitations of the Sahin study involved the small number of teachers that were surveyed. The focus was on the CLS in Izmir, Turkey, rather than the public school system, and it appeared to be isolated. The study included 236 teachers; however, only 157 surveys were usable due to language barriers. The emic and etic experiences in the Izmir community may impact the teacher perceptions, as compared to teachers in the Kentucky career and technical education system. The value of the educational system and the perceptions surrounding education in general may impact the results of the research. Teachers may have varying preferences in instructional leadership due to their life experiences, and their life experiences may be very different from those of CTE teachers in Kentucky.

Sahin explored the relationship between instructional leadership and a positive school culture. The research revealed that instructional leadership has a significant impact on school culture. Costellow’s (2011) study of teacher preferences in leadership traits and behaviors reinforced the need for instructional leadership. Both Sahin (2011)
and Costellow (2011) studied the effects of instructional leadership and its significant impact on positive school culture. Similarly, each study exposed that teachers and administrators identified the same leadership traits they felt were necessary for a positive school culture and student success.

The results of both research studies showed a direct correlation with instructional leadership traits. Sahin (2011) indicated that the teachers with a positive perception of their principal’s instructional leadership style also felt that their school had a positive school culture. Costellow’s (2011) study demonstrated that teachers and principals identified the same nine leadership traits necessary for student achievement and a positive school culture. Male and female teachers identified transformational leadership as necessary for student achievement. Correspondingly in both studies, instructional leadership was significant in relation to student achievement. However, the studies revealed that the instructional leader most significantly influences school culture. Teachers preferred the instructional leader who demonstrates the leadership traits of communication, discipline, culture, visibility, and focus. Sahin (2011) suggested that principals who demonstrated these traits led schools in which teachers perceived a positive school culture.

Sahin suggested that the field of educational leadership will continue to impact school culture. The research indicated that the role of the instructional leader will continue to influence the culture and the climate of the school building. The study also exposed the need for more in-depth and continued professional development opportunities for teachers. Sahin predicted that school systems will place a stronger emphasis on the role of principal as instructional leader, and added that the school leader
will be more prevalent as the single most important factor in building a positive school culture. Costellow’s (2011) research reinforced Sahin’s (2011) predictions for the field of educational leadership. Costellow (2011) suggested that the leadership traits of the building principal will have a more significant impact on student achievement and school culture in the future. Costellow implied that professional development programs for teachers will require principals to serve as instructional leaders in their building and predicted that the building principal will be expected to move from the role of manager to the role of instructional leader. The demand for instructional leaders in Kentucky public school districts will increase considerably over the next decade. The field of educational leadership has consistently shifted to include the development of teachers. Technology developments have forced building leaders to incorporate teaching strategies and curriculum in order to support the technological advances. In an effort to maintain teacher skill sets necessary to motivate students, principals will need to invest more time in the instructional leadership role. Principals will be required to attend professional development training and conferences in order to garner information to assist with the professional development of teachers and to incorporate the latest technology. The instructional leadership responsibility will be the primary focus for the next generation leaders in the Kentucky public school system.

**Summary**

This review of current literature focused on (a) school improvement in the CTE setting, (b) assessment instruments, (c) effective leadership and behavioral traits, (d) the SISI document and the impact on school improvement, (e) the SISR as a replacement for the Scholastic Audit and the potential impact for CTE, and (f) leadership and instruction
in the CTE schools. CTE has struggled in the last century to blend academic standards required through the Perkins Act and KDE and skill sets required by business and industry. Perkins legislation mandated the incorporation of math, literacy, and science standards in the CTE curriculum, while CTE teachers labored to maintain the fidelity of their program curriculum.

The SISI document is Kentucky’s guide for whole school reform. The literature is adequate surrounding the SISI, instructional leadership, and school improvement. Several studies have been conducted concerning educational leadership, behavioral traits, school improvement, and student achievement, but little research is available that links the SISI to the impact on student achievement. The research pertaining to CTE and instructional leadership is even more limited. It appears that the SISI document has never been utilized to evaluate CTE in Kentucky. Miller et al. (2012) introduced the SISR and optimistic results in the academic setting. The SISR provided foundational data for further research concerning instruction, instructional leadership, and student achievement. Figure 1 is a depiction of this study.
Study Model

Leadership and Instruction in CTE Schools

CTE in Kentucky

Standards and Indicators for School Improvement

School Improvement in CTE Schools

Figure 1. Venn diagram of leadership in CTE schools
CHAPTER III: METHOD

Kentucky’s SISI consist of a framework for standards-based reform. The SISI encompasses whole school initiatives for student achievement and school improvement. The Scholastic Audit was developed by KDE to measure the fidelity of the SISI implementation for each school. Due to the invasive nature of the Scholastic Audit, the program was discontinued. Miller et al. (2014) developed a less expensive and more efficient instrument to evaluate schools, the SISR, designed to measure the implementation of the SISI through a set of teacher perceptual scales.

The current study utilizes the SISR to analyze the effects of building-level leadership on student achievement, as represented by Work Keys scores, KOSSA scores, and Industry Certification in the CTE setting. The SISR instrument will be distributed to KY TECH ATCs, career centers, and high school CTE programs to gather data. The research will be used to investigate potential relationships among demographic factors specific to CTE schools, Leadership (SISI Standard 7), Instruction (SISI Standard 3), and CTE student outcomes.

Research Questions

The following research questions guide this study:

1. To what degree do demographic factors relate to teacher perceptions of the Standard 7 (Leadership), Standard 3 (Instruction), and the Career Readiness Accountability Measures in Kentucky?

2. To what degree does Standard 7 (Leadership) relate to Standard 3 (Instruction) and Career Readiness Accountability Measures in Kentucky?

3. To what degree does Standard 7 (Leadership) and Standard 3 (Instruction)
relate to Career Readiness Accountability Measures in Kentucky?

4. To what degree does Standard 3 (Instruction) mediate the effect of Standard 7 (Leadership) on the Career Readiness Measures in Kentucky, controlling for demographic factors?

The following section describes the research methods to be used for this study. Research design, description of population and sample, instrumentation, and data collection are segments that was explained.

**Research Design**

This quantitative research investigates data from the SISR as it pertains to the CTE environment. The study analyzed the effects of the building-level principal on student achievement, as represented by Work Keys scores, KOSSA scores, and industry certifications offered in the CTE setting. The SISR, an instrument that measures teacher perceptions of the nine SISI standards was utilized to gather data to investigate potential relationships between socio-demographic factors (gender, content area, education level, school type, and race; perceptions of the 9 Standards; and student outcomes. The 9 Standards were organized into three components: Academic Performance, Learning Environment, and Efficiency (KDE, 2003).

For the current study, only the data for Leadership (Standard 7) and Instruction (Standard 3) were examined. The research design was a descriptive survey, utilizing ANOVAs, t-Test, and the Pearson $r$ as the principal method of analysis. The controls included type of school as a unit of analysis and other demographic factors. The data were gathered through the SISR survey administered online via Qualtrics Software. Data from the SISR (teacher perceptions) were aggregated to the school level, which denotes
the unit of analysis. Work Keys, KOSSA, and industry certifications (dependent variables) and demographic controls were retrieved from KDE School Report Card on the state website and added to the database for each school. Additional information regarding the analysis of data can be found in the Data Analysis section.

**Population**

The population for the current study included all teachers in Kentucky who teach a Career and Technical Education course in one of three settings: KY TECH Area Technology Centers, locally controlled career centers, or CTE teachers in the public school setting. Eligible teachers maintained CTE certification through the Kentucky Education Professional Standards Board.

**Sample and Data Collection Procedures**

The sample for this study included CTE teachers who elected to participate in the SISR survey. An outline for the research was presented to principals in all three sectors at the Kentucky Association for Career and Technical Education Summer Program 2013. The SISR was offered online through the Qualtrics data analysis program to all CTE teachers at their respective faculty meetings in each of the three sectors. In this setting, the participation rate was expected to be much higher, which should have increased the sample size and provided richer data.

The CTE principals scheduled a designated faculty meeting to administer the SISR to all CTE teachers. The survey required 30-45 minutes to complete. The data collected through the SISR was compiled and entered into SPSS 20 for multiple analysis to determine relationships among socio-demographic factors (gender, content area, education level, school type, and race); perceptions of the 9 Standards; and student
Instrumentation

The SISR is an adaptation of the 9 Standards 88 Indicators of the SISI. After multiple reviews, the final SISR was reduced to 9 Standards and 62 Indicators. The instrument was designed by a research team at Western Kentucky University. Miller et al., (2013) attempted to replace the Scholastic Audit with a less invasive, brief, inexpensive teacher perceptual scale that capture the relationship between the degree of implementation of the SISR standards and student achievement. The current study incorporated the SISR in the CTE setting, which had never been attempted. The investigation utilized socio-demographic control factors, and the SISR instrument to compare influences on student achievement from selected standards of the new SISR instrument. Central to the current study is the role of leadership in CTE schools.

The pilot test is an important component for some studies. Slavin (2006) asserted that a pilot test provides the opportunity to identify items that may not align with the intentions of the survey. As a preliminary study, the SISR pilot test for the academic component was completed. The current CTE study utilized the same SISR instrument introduced in the academic pilot to elicit data from KY TECH ATCs, career centers, and secondary CTE programs.

The SISR was developed by a research team composed of Dr. Stephen K. Miller, Dr. Gary W. Houchens, Dr. Kyong Hee Chong, with the help of Mr. Richard Hunt at Western Kentucky University. Following analyses, the team reduced the SISR indicators from 88 to 62. Standards were redesigned and renamed in order to appeal to teachers. The exhaustive review led to two innovations: 1) a dual response matrix was developed,
with two 5-point Likert scales including level of implementation and level of
effectiveness, and 2) teachers rated each of the standards based on priority in their
building utilizing the 5-point Likert scale. The review revealed the need for a socio-
demographic section.

The pilot generated 252 responses from teachers. All 9 Standards maintained
integrity through the factor analysis and Cronbach’s Alpha. Miller et al. (2012) noted
that the mean R-squared for the old Scholastic Audit was .292; conversely, the mean R-
squared for the new SISR is .678 making the SISR over twice as effective in predicting
student achievement as the old process. The priority rankings for the short-term
composite generated a .935 correlation while the long term composite produced a .951
correlation which is close to a perfect 1.0. The results of the pilot revealed the SISR as a
viable instrument for further research concerning school improvement. For these
reasons, the SISR was utilized as the primary tool in this study.

**Independent Variables**

The first independent variable, Demographic Control Factors, includes the three
types of CTE schools represented in the study, in addition to socio-demographic factors
measured at the school level. The second is Efficiency which includes Leadership
(Standard 7) taken from the SISR document. Similar to Efficiency, the last independent
variable, Academic Performance, constitutes teacher perceptions taken from Standard 3
/Instruction) of the SISR document. All data were uploaded to SPSS 20 for analysis.
The following sections represent conceptual descriptions of the variables incorporated
into this investigation.
Demographic Control Factors

The demographic variables provided insight into the school environment in which the CTE teachers operate. The background information, aggregated by school sector, included race, gender, teaching experience, education level, teacher preparation, industry-based work experience, and content area. In addition, a key distinction is the type of school in which the CTE occurs: KY TECH ATC, career centers, and Local High School CTE Program. The data were analyzed using multiple analysis to determine relationships between the various factors, while using the types of CTE schools as a unit of analysis.

Programmatic Factors

The SISR is an adaptation of the original SISI document which was previously used by the KDE. Miller et al. (2013) designed the instrument as a “quick, noninvasive, inexpensive set of teacher perceptual scales” (p. 2). The nine SISR standards are grouped into three distinct categories: Academic Performance --- Standards 1 – 3, Learning Environment --- Standards 4 – 6, and Efficiency — Standards 7 - 9. The profile provides teacher perceptual scales for each of the 9 Standards. However, only Standards 7 and 3 (representing the SISR groupings for Efficiency and Academic Performance, respectively) were analyzed for this research.

Dependent Variables

Work Keys

The Work Keys Assessment was developed in the 1980s by ACT, Inc., in an effort to measure workplace skills. The instrument consists of three elements: job skill assessment, job analysis, and skill training. While the Work Keys measures 12 separate
topics, the focus was narrowed to three areas: Applied Mathematics, Locating Information, and Reading for Information (KDE, 2015). The Applied Math section provides work-related problems that require mathematical analysis for solutions. The Locating Information component incorporates tables, charts, graphs, and floor plans in the questioning process. The Reading for Information section measures the examinee’s ability to comprehend bulletins, manuals, regulations, and work-related memos. The Work Keys Assessment scores are classified as bronze, silver, gold, and platinum. ACT considers that those students who earn the Bronze are prepared for 35% of the jobs introduced in the job summary. Students who earn Silver are ready for 65% of the jobs explained in the job summary, Gold students are prepared for 90% of the jobs, and Platinum students are prepared for 100% of the jobs profiled in the summary report. Students must score Silver or higher to receive the NCRC and to satisfy the requirements of KDE Career Readiness Model.

The KWIB includes the Work Keys Assessment as a component of their economic development plan and as part of the criteria for communities to earn “Work Ready Community” status. Winkler (2012) defined work ready communities as regions that host a highly skilled workforce, provide an adequate infrastructure to support manufacturing facilities, and have transportation systems to transfer product. Holliday (2012) asserted that KDE embedded the Work Keys Assessment in the Career Readiness Model during the CTE restructure in an effort to align the public education system with the needs of business and industry.

Kentucky Occupational Skills Standard Assessment (KOSSA)

Winkler (2012) asserted that the KOSSA is a “tool to assess technical skill
attainment required under Perkins legislation” (p. 2). The instrument was developed in 1998 and incorporated standards based on input from business and industry. It was implemented in 2000 and is distributed to all CTE students who have completed two technical credits and are enrolled in a third credit. When a student meets the criteria earlier than the senior year and is assessed, the score is not considered for the career readiness measure until the senior year. The standards were developed into three broad categories: academic, employability, and occupational (KDE, 2013b). The CTE curriculum was aligned to these standards; ultimately, the KOSSA is used to measure how effectively the standards are incorporated into each program. According to Winkler, the KOSSA is a critical piece in the Career Readiness Model for KDE. It is an option in the technical component of the model and it measures the skill sets developed by CTE students.

**National Industry Certifications.** The secondary option under the Technical component of the Career Readiness model is the National Industry Certification (KDE, 2013b). Students can earn an industry certification by completing career related work experience and by meeting benchmarks on the written exam in the technical content area. Holliday (2012) suggested that KDE incorporate the industry certifications into the Career Readiness model for each of the 16 Career Clusters due to the demands of business and industry, as expressed through the KWIB. Students who earn the industry certification are fast-tracked in the hiring pool and are given priority consideration during the hiring process. Winkler (2013) asserted that the Industry Certifications were be approved for the Career Readiness component of KDE model and for the federal Perkins Accountability model when they meet the following criteria: recognized and required by
industry, recommended by national or state industries, aligned with curriculum and national standards, and designed to be administered after a sequence of courses within a career pathway.

While KDE has generated an exhaustive list of approved industry certifications to provide multiple options across the state, the majority of programs have selected primary industry certifications that students attempt in their particular technical area. Automotive Technology focus on ASE, Welding Technology programs test students through the AWS, Computerized Measuring and Machining utilize NIMS, and Business Education teachers assess students in an effort to earn Microsoft Plus certification. CTE teachers seek the certifications that are recognized by their local business and industry partners. Career and Technical Education students who have completed two credits and have enrolled in a third credit of a particular technical content area are considered preparatory students. KDE mandates that all CTE preparatory students be tested in Work Keys and KOSSA. In addition, preparatory students who complete a course sequence are encouraged to test for an Industry Certification when funding is available. When students meet benchmarks in Work Keys and KOSSA or National Industry Certification, they are considered career ready.

**Data Analysis**

The demographic factor, type of school, served as the unit of analysis. The one-way analysis of variance (ANOVA) segregated the demographic factors to determine the effect of each on the dependent variables, Work Keys scores, KOSSA scores, and Industry Certifications. Factor analysis is a process utilized to analyze the degree to which measurements overlap (Williams, 1992) or are present among a group of items.
The computations configure the items into subsets of identifiable constructs or factors (Nunnally & Bernstein, 1994). Factor analysis was conducted to determine construct validity. Cronbach’s alpha was utilized to determine reliability. External validity coefficients for school-level achievement were computed for each standard and for the priority rankings.

**Summary**

The results of the current study provide results on the impact of a mediated model of leadership on student achievement, through its effect on instruction. The SISR was the primary instrument for gathering data (Miller et al., 2014), and participants in the study were CTE teachers. The SISR was distributed to CTE teachers in the KY TECH area technology centers, locally controlled career centers, and CTE teachers in the public school setting. Due to the lack of empirical evidence surrounding CTE and school improvement, the study design included demographic factors. Miller et al. (2014) suggested that the SISR measures teacher perceptions concerning school improvement, thus providing a window into relationships that may exist between school level demographic factors detailed above, the targeted standards from the SISR (Leadership and Instruction), and student achievement.

This quantitative research study addresses leadership behaviors specifically associated with instruction for their effect on student achievement in CTE schools. The research design is correlational and incorporates a causal comparative analysis of the three types of CTE schools. Multiple correlation and ANOVA were the primary methods of statistical analysis. By revealing insight into CTE teacher perceptions, this knowledge provides the following: (a) a foundation for the renovation of the school improvement
process for the OCTE in Kentucky, (b) evidence to support a new teacher preparation program in the KY TECH system, and (c) evidence to support the need for the development of instructional leadership traits in CTE principals.
CHAPTER IV: RESULTS

The current quantitative study addressed leadership behaviors specifically associated with instruction relative to their effect on student achievement in CTE schools. The purpose of the current study was to examine a portion of the SISI, specifically analyzing the impact of a mediated model of Leadership (Standard 7) on student achievement through its effect on Instruction (Standard 3). The SISR was the primary instrument utilized to gather data (Miller et al., 2014). The SISR was distributed to CTE teachers in the KY TECH ATCs, teachers within locally-controlled career centers, and CTE teachers in the public school setting. Due to the lack of empirical evidence surrounding CTE and school improvement, the study design also included demographic factors. Miller et al. (2014) suggested that the SISR measures teacher perceptions concerning school improvement, thus providing a window into relationships that may exist between school-level demographic factors (e.g., teacher preparation in CTE schools, education level, years of experience, and type of CTE school). The targeted Standards 7 and 3 from the SISR (Leadership and Instruction) and student achievement were analyzed to determine descriptive statistics and correlations among variables. The independent variables included Education Level, Teacher-preparation, Teaching Experience, Content Area, and School Type. The dependent variable was Student Achievement which combined Work Keys scores, KOSSA scores, Industry Certifications, and Career Readiness.

The SISR instrument was distributed online via Qualtrics to teachers in each of three CTE school setting in Kentucky. The research design was correlational in nature and incorporated a causal comparative analysis of the three types of CTE schools. Data
analysis was performed through descriptive statistics, bivariate correlational analysis (Pearson’s $r$), independent $t$-tests, ANOVA, and Cronbach’s alpha. The population for the current study included all CTE teachers in the KDE. The preliminary sample encompassed 161 KY TECH CTE teachers, 33 locally-controlled career centers, and 45 CTE teachers in the comprehensive high school setting who participated by school sector. The initial sample was later modified for analyses purposes.

**Standards and Indicators for Scholastic Review (SISR) Scales**

The SISI is a framework for whole school standards-based reform. The Scholastic Audit has been the primary process for evaluating schools since the SISI was adopted in 1998. Although the SISI provides the linkage between leadership and instruction that is needed for CTE schools, utilization of the Audit process is no longer feasible. The Kentucky Department of Education discontinued the Scholastic Audit, primarily due to the excessive costs and time required to administer the weeklong external visit, which established the evaluation as prohibitive (Miller et al., 2013).

Miller et al. (2013) argued that the SISR may effectively replace the Scholastic Audit process for KDE schools. The SISR contains teacher perceptual scales designed to capture the information from the external Scholastic Audit through a 45-minute survey instrument. The pilot study to validate the new instrument was completed for eight schools in the GRREC region of Kentucky. Cronbach’s alpha was conducted, and the instrument was found to be valid and predictive of student achievement. The results showed significant correlations between the SISI and student achievement. The data analysis revealed that the nine standards within the SISI held up through the factor
analysis and reliability testing. More detailed information on the SISR is provided in the preceding chapter.

Permission was obtained from WKU’s research team (RCAP) to utilize the SISR in the CTE setting as the primary instrument to gather data (Miller et al., 2014). The SISI Standards are divided into three categories: Standards 1-3 (Academic Performance), Standards 4-6 (Learning Environment), and Standards 7-9 (Efficiency) (KDE, 2003). Although the SISR is designed to examine nine standards and 62 indicators, the current study utilized the psychometric variables representing Standards 3 (Instruction) and Standard 7 (Leadership), respectively. Psychometric questions 1 through 24 considered Standard 3, and questions 45 through 68 examined Standard 7. In Part B of the survey, Standard 3, a and b, and Standard 7, a and b, were utilized. The full SISR survey can be found in Appendix E. The selected components of the SISR are pertinent to the study and were utilized to address the Research Questions.

**Research Questions**

The current study analyzed the effects of building-level leadership on student achievement, as represented by Work Keys scores, KOSSA scores, and Industry Certification in the CTE setting. The SISR was utilized to gather data to investigate potential relationships among (a) demographic factors specific to CTE schools, (b) Leadership (Standard 7), (c) Instruction (Standard 3), and (d) CTE student outcomes. The central Research Question is as follows: To what extent is instructional leadership related to accountability outcomes in CTE schools?

The following empirical Research Questions guided this study:
1. To what degree do demographic factors relate to teacher perceptions of the Standard 7 (Leadership), Standard 3 (Instruction), and the Career Readiness Accountability Measures in Kentucky?

2. To what degree does Standard 7 (Leadership) relate to Standard 3 (Instruction) and Career Readiness Accountability Measures in Kentucky?

3. To what degree do Standard 7 (Leadership) and Standard 3 (Instruction) relate to Career Readiness Accountability Measures in Kentucky?

4. To what degree does Standard 3 (Instruction) mediate the effect of Standard 7 (Leadership) on the Career Readiness Measures in Kentucky, controlling for demographic factors?

The results of the administration of the SISR will be described in the corresponding sections. The Participant and Demographic sections will be combined for descriptive statistics analysis. The remaining sections will be identified and presented by Research Question. The first Research Question was analyzed through descriptive statistics. Research Questions 2, 3, and 4 were combined for data analysis. Outputs were summarized to report the results of each Research Question. The findings will be reported by narrative and statistical findings.

**Participants**

The population for the study included CTE teachers in the KY TECH ATCs, teachers in the locally-controlled career centers, and CTE teachers in the comprehensive high school. The sample for the current study encompassed 161 KY TECH CTE teachers, 33 locally-controlled career centers, and 45 CTE teachers in the comprehensive high school setting who volunteered to participate by school sector. The SISR was
designed to capture teacher perceptions concerning instructional leadership, school improvement, and student achievement through 79 two-part questions. The total responses on the survey were 266 participants, with 36 incomplete surveys; the 36 incomplete surveys were removed. After further analysis, an additional 27 surveys were removed due to discrepancies in responses. A description of participants is represented in Table 4. Due to a biased distribution by school sector, a random sample of 40 was used for the KY TECH school type to create a balanced distribution by school sector. For analysis purposes, KY TECH utilized 40 participants, locally-controlled career centers utilized 33 participants, and comprehensive high school CTE teachers utilized 45 participants. A full list of participants by county and school type can be found in Appendix D.

Demographics

The initial demographic section included variables for principal and years of experience for principals. After preliminary analysis, the variables were not significant or contained imbalanced results. For the purposes of the current study, CTE School Type, Years of Teaching Experience, Education Level, NTI participation, Career Cluster, and Gender were utilized for statistical analysis. The descriptive statistics were compiled and presented. Table 4 provides an overarching description of the demographic section.

School Type

The Office of Career and Technical Education provides career and technical education programs through three venues: KY TECH ATCs, locally-controlled career centers, and comprehensive high school CTE programs. While each sector provides career and technical education to students enrolled in a particular pathway, the school is
operated under different policies, guidelines, and governance. In an effort to identify relationships among Leadership (Standard 7), Instruction (Standard 3), and student achievement in the CTE setting, the current study examined teacher perceptual scales by school type for Research Questions 1 through 4. The data are distributed by school type in Table 4.

**Position**

The Position variable was utilized to identify principals by school type who participated in the SISR. The intent of this variable was to elicit principal perceptions concerning Leadership and Instruction. Due to the low participation rate, the results for the Position section were deterring and provided little value for this research. Therefore, this variable is not considered for the data analysis.

**Gender**

The purpose of the Gender variable was to add an additional dimension to the analysis. Career and Technical Education in Kentucky has traditionally been overshadowed by male teachers (Winkler, 2012). The survey results supported that statement. Due to the imbalanced distributions for gender, statistical analysis was not performed. The frequency distribution for males revealed 150 (60.24%) and 99 (39.76%) for females. The SISR results revealed a larger number of male teachers in the Construction, Manufacturing, and Transportation career clusters. Female teachers were predominantly reported in the Information Technology and Business Management and Administration. A dissection of data by school type can be found in Table 4.
Table 4

**CTE SISR Demographics**

<table>
<thead>
<tr>
<th>Type of School</th>
<th>Position</th>
<th>Employment</th>
<th>Gender</th>
<th>Highest Degree Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Less than A.S. Degree</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>KY TECH Area Technology Center</td>
<td>K-12 Principal</td>
<td>1.00</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td></td>
<td>CTE Principal</td>
<td>13.78</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>CTE Teacher</td>
<td>7.39</td>
<td>48</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>All</td>
<td>8.27</td>
<td>56</td>
<td>23</td>
</tr>
<tr>
<td>Locally-controlled Career Center</td>
<td>K-12 Principal</td>
<td>9.00</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>CTE Principal</td>
<td>11.60</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>CTE Teacher</td>
<td>10.04</td>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>All</td>
<td>10.18</td>
<td>8</td>
<td>25</td>
</tr>
<tr>
<td>Comprehensive High School CTE Program</td>
<td>K-12 Principal</td>
<td>6.33</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>CTE Teacher</td>
<td>7.47</td>
<td>30</td>
<td>15</td>
</tr>
<tr>
<td>All</td>
<td>K-12 Principal</td>
<td>6.71</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>CTE Principal</td>
<td>13.39</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>CTE Teacher</td>
<td>7.75</td>
<td>82</td>
<td>122</td>
</tr>
<tr>
<td>All</td>
<td>All</td>
<td>8.38</td>
<td>94</td>
<td>145</td>
</tr>
</tbody>
</table>
Education Level

The education level data were disaggregated by school type. The variation in degree requirements by school type supported the significance of these data. The variable *Less than an A. S. Degree (N = 25, 10.04 %)* was almost isolated to KY TECH ATC teachers. The results revealed that over 10 % reported less than an A. S. Degree indicating they were employed based on their work experience, which may skew their interpretation of instructional leadership. The variable *A. S. Degree (N = 58, 23.39 %)* primarily applied to KY TECH ATC teachers as well, representing a combined 33% of the sample with an A. S. Degree or less. The variables *Bachelor’s Degree (N = 54, 21.69 %), Master’s Degree (N = 83, 33.33%), Specialist (N = 24, 9.64%), and Doctorate (N = 5, 2.01%)* represented 67% of the responses. While CTE is known for a rich background in work experience, the results suggested that a larger number of CTE teachers maintain a B. S. Degree or higher suggesting a commitment to professional growth. In an effort to balance the data for statistical analysis, the Specialist and Doctorate variables were combined representing over 11% of the sample. The education level was used for the statistical analysis of psychometric data in Research Questions 1 through 4.

Years of Experience

Descriptive statistics analysis was performed based on years of experience as a CTE teacher. Table 5 is a reflection of individual years of CTE teaching experience prior to compilation.
Table 5

**CTE Years of Teaching Experience**

<table>
<thead>
<tr>
<th>Years of Teaching Experience</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>32</td>
<td>13.39</td>
<td>13.39</td>
</tr>
<tr>
<td>2 years</td>
<td>15</td>
<td>6.28</td>
<td>19.67</td>
</tr>
<tr>
<td>3 years</td>
<td>6</td>
<td>2.51</td>
<td>22.18</td>
</tr>
<tr>
<td>4 years</td>
<td>11</td>
<td>4.60</td>
<td>26.78</td>
</tr>
<tr>
<td>5 years</td>
<td>10</td>
<td>4.18</td>
<td>30.96</td>
</tr>
<tr>
<td>6 years</td>
<td>10</td>
<td>4.18</td>
<td>35.15</td>
</tr>
<tr>
<td>7 years</td>
<td>14</td>
<td>5.86</td>
<td>41.00</td>
</tr>
<tr>
<td>8 years</td>
<td>13</td>
<td>5.44</td>
<td>46.44</td>
</tr>
<tr>
<td>9 years</td>
<td>16</td>
<td>6.69</td>
<td>53.14</td>
</tr>
<tr>
<td>10 years</td>
<td>15</td>
<td>6.28</td>
<td>59.41</td>
</tr>
<tr>
<td>11 years</td>
<td>6</td>
<td>2.51</td>
<td>61.92</td>
</tr>
<tr>
<td>12 years</td>
<td>6</td>
<td>2.51</td>
<td>64.44</td>
</tr>
<tr>
<td>13 years</td>
<td>6</td>
<td>2.51</td>
<td>66.95</td>
</tr>
<tr>
<td>14 years</td>
<td>11</td>
<td>4.60</td>
<td>71.55</td>
</tr>
<tr>
<td>15 years</td>
<td>8</td>
<td>3.35</td>
<td>74.90</td>
</tr>
<tr>
<td>16 years</td>
<td>7</td>
<td>2.93</td>
<td>77.82</td>
</tr>
<tr>
<td>17 years</td>
<td>6</td>
<td>2.51</td>
<td>80.33</td>
</tr>
<tr>
<td>18 years</td>
<td>8</td>
<td>3.35</td>
<td>83.68</td>
</tr>
<tr>
<td>19 years</td>
<td>5</td>
<td>2.09</td>
<td>85.77</td>
</tr>
<tr>
<td>20 years</td>
<td>6</td>
<td>2.51</td>
<td>88.28</td>
</tr>
<tr>
<td>21 years</td>
<td>5</td>
<td>2.09</td>
<td>90.38</td>
</tr>
<tr>
<td>22 years</td>
<td>2</td>
<td>.84</td>
<td>91.21</td>
</tr>
<tr>
<td>23 years</td>
<td>4</td>
<td>1.67</td>
<td>92.89</td>
</tr>
<tr>
<td>24 years</td>
<td>4</td>
<td>1.67</td>
<td>94.56</td>
</tr>
<tr>
<td>25 years</td>
<td>4</td>
<td>1.67</td>
<td>96.23</td>
</tr>
<tr>
<td>26 years</td>
<td>2</td>
<td>.84</td>
<td>97.07</td>
</tr>
<tr>
<td>27 years</td>
<td>2</td>
<td>.84</td>
<td>97.91</td>
</tr>
<tr>
<td>28 years</td>
<td>1</td>
<td>.42</td>
<td>98.33</td>
</tr>
<tr>
<td>29 years</td>
<td>1</td>
<td>.42</td>
<td>98.74</td>
</tr>
<tr>
<td>30 years</td>
<td>1</td>
<td>.42</td>
<td>99.16</td>
</tr>
<tr>
<td>31 or more</td>
<td>2</td>
<td>.84</td>
<td>100.00</td>
</tr>
</tbody>
</table>

The results indicated that 59% of participants were teachers with 10 years or less teaching experience in the CTE setting. Over 26% of participants were employed on an annual
contract and identified 4 years or less teaching experience. Non-tenured teacher responses may be different from tenured teachers. For the current study, the years of experience were divided into three equivalent sections for data analysis. The first section included year 1 to year 5, the second section represented years 6 to 12, and the final section incorporated 13 to over 31 years. The disaggregation of years of experience by school type was used in the psychometric analysis of implementation and efficiency as they pertain to Research Questions 1 through 4.

**Career Cluster**

The OCTE has adopted 16 specific career clusters for the Career Readiness Model (Winkler, 2012). CTE students are encouraged to enroll in a sequence of courses for a career pathway that leads to a postsecondary transition to a career or college situation. Table 6 is a presentation of the 16 clusters adopted by KDE. The frequency is identified by career cluster and the overall percentages of participants by career cluster, respectively. While the 16 career clusters were identified for selection on the SISR, the instrument resulted in 51 missing responses. One explanation for the missing responses is the anonymity factor. The smaller schools in the KY TECH ATCs may contain only one career cluster. The selection of the career cluster becomes an identifying factor. This is a limitation of this study and is explained further later in this chapter. Therefore, the Career Cluster scale was utilized for descriptive statistics and excluded for correlational analysis. The Career Cluster calculations are identified in Table 6.
Table 6

16 Career Clusters for CTE

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Frequency</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture, Food, &amp; Natural Resources</td>
<td>12</td>
<td>6.38</td>
<td>12</td>
<td>6.38</td>
</tr>
<tr>
<td>Arts, A/V Technology, &amp; Communication</td>
<td>1</td>
<td>.53</td>
<td>13</td>
<td>6.91</td>
</tr>
<tr>
<td>Architecture &amp; Construction</td>
<td>22</td>
<td>11.70</td>
<td>35</td>
<td>18.62</td>
</tr>
<tr>
<td>Business Management &amp; Administration</td>
<td>29</td>
<td>15.43</td>
<td>64</td>
<td>34.04</td>
</tr>
<tr>
<td>Education &amp; Training</td>
<td>9</td>
<td>4.79</td>
<td>73</td>
<td>38.83</td>
</tr>
<tr>
<td>Finance</td>
<td>1</td>
<td>.53</td>
<td>74</td>
<td>39.36</td>
</tr>
<tr>
<td>Health Sciences</td>
<td>26</td>
<td>13.83</td>
<td>100</td>
<td>53.19</td>
</tr>
<tr>
<td>Hospitality &amp; Tourism</td>
<td>2</td>
<td>1.06</td>
<td>102</td>
<td>54.26</td>
</tr>
<tr>
<td>Human Services</td>
<td>5</td>
<td>2.66</td>
<td>107</td>
<td>56.91</td>
</tr>
<tr>
<td>Information Technology</td>
<td>6</td>
<td>3.19</td>
<td>113</td>
<td>60.11</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>33</td>
<td>17.55</td>
<td>146</td>
<td>77.66</td>
</tr>
<tr>
<td>Marketing</td>
<td>3</td>
<td>1.60</td>
<td>149</td>
<td>79.26</td>
</tr>
<tr>
<td>Science, Technology, Engineering, &amp; Mathematics</td>
<td>12</td>
<td>6.38</td>
<td>161</td>
<td>85.64</td>
</tr>
<tr>
<td>Transportation, Distribution, &amp; Logistics</td>
<td>27</td>
<td>14.36</td>
<td>188</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Note: Frequency Missing = 51

New Teacher Institute (NTI)

The OCTE recruits potential CTE teachers from the business and industry sector. Teachers are required to have completed four years of work experience, have met benchmarks on the Compass or ACT exam, and successfully completed the National Occupational Competency Assessment Institute (NOCTI) (Arnold, 2013). Walter and Kapes (2003) asserted that the NOCTI is a valid instrument to demonstrate vocational skill sets necessary to teach a subject area through a competency-based examination. Upon selection of a candidate, they are required to attend the New Teacher Institute
(NTI) in Frankfort. The NTI experience consists of a weeklong intense teacher training with a two-day follow up. This teacher preparation program is offered to CTE teachers in KY TECH and locally-controlled career centers (Arnold, 2013).

A t-test was performed to compare responses of teachers who participated in the NTI experience and those who attended a four-year formal teacher preparation program. The results of the independent t-test were not significant for most of the teacher perceptual scales: \( N = 239 \), Instruction Implementation \( (t = .32) \), Instruction Effectiveness \( (t = .57) \), Leadership Implementation \( (t = .25) \), Leadership Effectiveness \( (t = .60) \), Leadership Short Term \( (t = .28) \), and Leadership Long Term \( (t = .38) \) indicating there is no significant difference between CTE teachers who attended NTI \( (N = 143, M = 3.79) \) and those who did not \( (N = 96, M = 3.71) \). However, the Instruction Short Term \( (t = .04) \) and Instruction Long Term \( (t = .034) \) were found to be significant indicating a considerable difference between teachers who attended NTI \( (M = 4.06) \) and those who did not attend NTI \( (M = 3.8) \). The data analysis of the principal’s approach to improving instruction in the daily operation of the school, or in the future plans for improvement for instruction were different when compared to the teacher preparation program of participants. Table 7 provides a depiction of the results.
Table 7

*T-test Differences Between Teachers Participating in NTI Among Each Scale*

<table>
<thead>
<tr>
<th>Scales</th>
<th># of Items</th>
<th>NTI Participant</th>
<th>NO NTI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>Instruction Implementation</td>
<td>24</td>
<td>3.79 (.57)</td>
<td>3.71 (.57)</td>
</tr>
<tr>
<td>Instruction Efficiency</td>
<td>24</td>
<td>3.68 (.56)</td>
<td>3.64 (.60)</td>
</tr>
<tr>
<td>Leadership Implementation</td>
<td>23</td>
<td>3.81 (.67)</td>
<td>3.70 (.75)</td>
</tr>
<tr>
<td>Leadership Efficiency</td>
<td>23</td>
<td>3.66 (.65)</td>
<td>3.61 (.75)</td>
</tr>
<tr>
<td>Leadership Short Term</td>
<td>9</td>
<td>3.92 (.66)</td>
<td>3.82 (.72)</td>
</tr>
<tr>
<td>Leadership Long Term</td>
<td>9</td>
<td>3.97 (.71)</td>
<td>3.89 (.74)</td>
</tr>
</tbody>
</table>

*Note. *(p < .05).*

**Student Achievement**

According to Winkler (2012), the OCTE measures student achievement in the CTE setting in accordance with KDE’s College and Career Readiness Model. Winkler asserted that CTE teachers are responsible for preparing students for the Work Keys, KOSSA, and Industry Certifications in their career pathway. Students who complete two credits, and who enroll in a third credit in a singular career pathway, are classified as preparatory students. Students with two credits or less in a particular career pathway are considered exploratory. In an effort to equally consider the three areas for student achievement, the total number of career ready students, by participating school, was divided by the total number of eligible preparatory seniors by school. CTE schools are
required to provide the Work Keys and KOSSA assessment to all preparatory seniors, as identified in KDE data analysis system (TEDS). The final percentage was calculated for data analysis. Student achievement was the independent variable for the current study.

Table 8 is a presentation of student achievement for all schools participating in the study.

Table 8

*Student Achievement*

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Std Dev</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTE Preparatory Students</td>
<td>239</td>
<td>116.11</td>
<td>83.11</td>
<td>20.0</td>
<td>470</td>
</tr>
<tr>
<td>Work Keys</td>
<td>239</td>
<td>52.92</td>
<td>27.35</td>
<td>4.0</td>
<td>249</td>
</tr>
<tr>
<td>KOSSA</td>
<td>239</td>
<td>49.94</td>
<td>55.14</td>
<td>4.0</td>
<td>733</td>
</tr>
<tr>
<td>Industry Certification</td>
<td>239</td>
<td>38.8</td>
<td>39.4</td>
<td>0.0</td>
<td>497</td>
</tr>
<tr>
<td>Career Ready</td>
<td>239</td>
<td>49.8</td>
<td>31.54</td>
<td>6.0</td>
<td>233</td>
</tr>
</tbody>
</table>

**Analysis of Research Questions – Part I**

The first Research Question examined the impact of demographic factors on Standard 7 (Leadership), Standard 3 (Instruction), and the career readiness measures. The ANOVA was used to test differences or mean scores of three or more groups or different groups. Three separate ANOVAs were calculated to determine differences in psychometric variables based on the demographic factors of School Type, CTE Teaching Experience, and Education Level. The first ANOVA focused on School Type. The results revealed no significant difference between the groups, Instruction implementation $F (2,110) = .55, p = .58$; Instruction Efficiency $F (2,110) = 1.02, p = .36$; Leadership
Implementation $F(2, 110) = .13, p = .88$; Leadership Efficiency $F(2, 110) = .17, p = .84$; Leadership Goals Short Term $F(2, 110) = .24, p = .79$; and Leadership Goals Long Term $F(2, 110) = .34, p = .37$. However, the Percent Career Ready reflected a significant difference between school types, $F(2, 110) = 18.72, p = < .0001$. The results are represented in Table 9.
Table 9

ANOVA Comparison of Teacher Perceptual Scales of Instruction and Leadership Between School Types

<table>
<thead>
<tr>
<th>Scales and Subscales</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Between Groups</td>
<td>0.4</td>
<td>2</td>
<td>0.2</td>
<td>0.55</td>
</tr>
<tr>
<td>Instruction</td>
<td>Within Groups</td>
<td>39.91</td>
<td>110</td>
<td>0.36</td>
<td></td>
</tr>
<tr>
<td>Implementation</td>
<td>Total</td>
<td>40.31</td>
<td>112</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Between Groups</td>
<td>0.73</td>
<td>2</td>
<td>0.37</td>
<td>1.02</td>
</tr>
<tr>
<td>Instruction</td>
<td>Within Groups</td>
<td>39.62</td>
<td>110</td>
<td>0.36</td>
<td></td>
</tr>
<tr>
<td>Efficiency</td>
<td>Total</td>
<td>40.36</td>
<td>112</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Between Groups</td>
<td>0.15</td>
<td>2</td>
<td>0.08</td>
<td>0.13</td>
</tr>
<tr>
<td>Leadership</td>
<td>Within Groups</td>
<td>67.03</td>
<td>110</td>
<td>0.61</td>
<td></td>
</tr>
<tr>
<td>Implementation</td>
<td>Total</td>
<td>67.18</td>
<td>112</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Between Groups</td>
<td>0.2</td>
<td>2</td>
<td>0.1</td>
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</tr>
<tr>
<td>Leadership</td>
<td>Within Groups</td>
<td>66.87</td>
<td>110</td>
<td>0.61</td>
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</tr>
<tr>
<td>Efficiency</td>
<td>Total</td>
<td>67.07</td>
<td>112</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Between Groups</td>
<td>0.26</td>
<td>2</td>
<td>0.13</td>
<td>0.24</td>
</tr>
<tr>
<td>Leadership Goals</td>
<td>Within Groups</td>
<td>59.49</td>
<td>110</td>
<td>0.54</td>
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</tr>
<tr>
<td>Short Term A</td>
<td>Total</td>
<td>59.75</td>
<td>112</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Between Groups</td>
<td>0.42</td>
<td>2</td>
<td>0.21</td>
<td>0.34</td>
</tr>
<tr>
<td>Leadership Goals</td>
<td>Within Groups</td>
<td>66.57</td>
<td>110</td>
<td>0.61</td>
<td></td>
</tr>
<tr>
<td>Long Term B</td>
<td>Total</td>
<td>66.99</td>
<td>112</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Between Groups</td>
<td>8927.91</td>
<td>2</td>
<td>4463.96</td>
<td>18.72</td>
</tr>
<tr>
<td>Percent Career</td>
<td>Within Groups</td>
<td>26226.22</td>
<td>110</td>
<td>238.42</td>
<td></td>
</tr>
<tr>
<td>Ready</td>
<td>Total</td>
<td>35154.14</td>
<td>112</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. SD = standard deviation; df = degrees of freedom; MS = mean squared; F = F value; p = significance (p < 0.05). Percent Career Ready was found to be significantly different by school type.

A second ANOVA was conducted to examine differences between the demographic factor of teaching experience and responses on the psychometric variables.

The Years of Teaching Experience was divided into three categories for data analysis.
The first group represented years 0 to 5, the second group included years 6 to 11, and the final group incorporated years 12 to 31 or more. The results exposed no significant difference for Instruction Implementation, $F(2, 230) = 1.42, p = .24$; Instruction Efficiency $F(2, 230) = 1.54, p = .22$; Leadership Implementation $F(2, 230) = .07, p = .93$; Leadership Efficiency $F(2, 230) = .09, p = .91$; Leadership Goals Short Term, $F(2, 230) = .01, p = .99$; and Leadership Goals Long Term $F(2, 230) = .11, p = .89$ between the three school types. The analysis of teaching experience between school types yielded no significant difference in the variables. The teacher preparation programs are different between school types. It is expected that the varying years of experience would influence the results of the current study. However, there was no significant difference based on years of teaching experience. Table 10 results are presented in Table 10.
Table 10

ANOVA Comparison Between Schools based on CTE Teaching Experience

<table>
<thead>
<tr>
<th>Scales and Subscales</th>
<th>Between Groups</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instruction Implementation</td>
<td>75.76</td>
<td>2</td>
<td>0.47</td>
<td>1.42</td>
<td>0.24</td>
</tr>
<tr>
<td>Total</td>
<td>76.69</td>
<td>230</td>
<td>0.33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instruction Efficiency</td>
<td>1.02</td>
<td>2</td>
<td>0.51</td>
<td>1.54</td>
<td>0.22</td>
</tr>
<tr>
<td>Total</td>
<td>77.61</td>
<td>232</td>
<td>0.33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leadership Implementation</td>
<td>111.43</td>
<td>2</td>
<td>0.03</td>
<td>0.07</td>
<td>0.93</td>
</tr>
<tr>
<td>Total</td>
<td>111.5</td>
<td>232</td>
<td>0.48</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leadership Efficiency</td>
<td>0.09</td>
<td>2</td>
<td>0.04</td>
<td>0.09</td>
<td>0.91</td>
</tr>
<tr>
<td>Total</td>
<td>108.02</td>
<td>232</td>
<td>0.47</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leadership Goals Short Term A</td>
<td>0.01</td>
<td>2</td>
<td>0.01</td>
<td>0.01</td>
<td>0.99</td>
</tr>
<tr>
<td>Total</td>
<td>107.68</td>
<td>232</td>
<td>0.47</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leadership Goals Long Term B</td>
<td>0.12</td>
<td>2</td>
<td>0.06</td>
<td>0.11</td>
<td>0.89</td>
</tr>
<tr>
<td>Total</td>
<td>119.39</td>
<td>232</td>
<td>0.52</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. SD = standard deviation; df = degrees of freedom; MS = mean squared; F = F value; p = significance (p < 0.05).

A third ANOVA was calculated to determine differences in responses based on Education Level. The results revealed no significant difference for Instruction Implementation $F(4, 115) = 1.14, p = .34$; Instruction Efficiency $F(4, 115) = 1.54, p = .22$; Leadership Implementation $F(4, 115) = 1.04, p = .39$; Leadership Efficiency $F(4, 115) = 1.34, p = .26$; Leadership Goals Short Term $F(4, 115) = 2.4, p = .05$; Leadership Goals...
Long Term $F(4, 115) = 2.36, p = .06$ between the three school types. A significant difference was found between Leadership Goals Short Term, $F(4, 115) = 2.4, p = .05$ and Percent Career Ready $F(4, 115) = 18.72, p < .0001$. The findings indicated a significant difference between short-term leadership goals and the percentage of career ready students. The three ANOVAs indicated that the percentage career ready was consistently significantly different. The data analysis of Education Level indicated there is a significant difference in the perceptions of teachers concerning the daily operation of the school and the number of career ready students identified. Table 11 is a reflection of the results.
Table 11

ANOVA Comparison Between Schools based on Education Level

<table>
<thead>
<tr>
<th>Scales and Subscales</th>
<th>Between Groups</th>
<th>df</th>
<th>MS</th>
<th>( F )</th>
<th>( p )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instruction</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Implementation</td>
<td>1.53</td>
<td>4</td>
<td>0.38</td>
<td>1.14</td>
<td>0.34</td>
</tr>
<tr>
<td>Within Groups</td>
<td>38.5</td>
<td>115</td>
<td>0.33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>40.03</td>
<td>119</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instruction</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Efficiency</td>
<td>1.35</td>
<td>4</td>
<td>0.51</td>
<td>1.54</td>
<td>0.22</td>
</tr>
<tr>
<td>Within Groups</td>
<td>45.07</td>
<td>115</td>
<td>0.33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>46.43</td>
<td>119</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leadership</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Implementation</td>
<td>2.3</td>
<td>4</td>
<td>0.57</td>
<td>1.04</td>
<td>0.39</td>
</tr>
<tr>
<td>Within Groups</td>
<td>63.7</td>
<td>115</td>
<td>0.55</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>65.99</td>
<td>119</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leadership</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Efficiency</td>
<td>3.09</td>
<td>4</td>
<td>0.77</td>
<td>1.34</td>
<td>0.26</td>
</tr>
<tr>
<td>Within Groups</td>
<td>66.2</td>
<td>115</td>
<td>0.58</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>69.29</td>
<td>119</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leadership Goals Short Term A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>5.11</td>
<td>4</td>
<td>1.28</td>
<td>2.4</td>
<td>0.05</td>
</tr>
<tr>
<td>Within Groups</td>
<td>61.25</td>
<td>115</td>
<td>0.53</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>66.36</td>
<td>119</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leadership Goals Long Term B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>5.57</td>
<td>4</td>
<td>1.39</td>
<td>2.36</td>
<td>0.06</td>
</tr>
<tr>
<td>Within Groups</td>
<td>67.96</td>
<td>115</td>
<td>0.59</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>73.53</td>
<td>119</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent Career Ready</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>8927.91</td>
<td>2</td>
<td>4463.96</td>
<td>18.72</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Within Groups</td>
<td>26226.22</td>
<td>110</td>
<td>238.42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>35154.14</td>
<td>112</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. SD = standard deviation; \( df \) = degrees of freedom; \( MS \) = mean squared; \( F \) = F-value; \( p \) = significance (\( p < 0.05 \)). Percent Career Ready was significantly different.
Analysis of Research Questions – Part II

The statistical analysis for this section combined Research Questions 2, 3, and 4. Bivariate correlations were utilized to examine potential relationships between psychometric constructs: Instruction Implementation, Instruction Efficiency, Leadership Implementation, Leadership Efficiency, Instruction Goals Short Term, Instruction Goals Long Term, Leadership Goals Short Term, and Leadership Goals Long Term. The analysis controlled for the demographic factors of School Type and CTE Teaching Experience.

The Pearson $r$ correlations revealed statistically significant relationships between Instruction Implementation and Instruction Efficiency, Leadership Implementation and Leadership Efficiency, Short-Term Instructional Goals and Long-Term Instructional Goals, and Short-Term Leadership Goals and Long-Term Leadership Goals. The correlations between Instruction and Leadership on all psychometric constructs were moderate to strong in the KY TECH school-type. Conversely, the relationship between psychometric variables and the Percent of Career Ready was significant but shared a weak relationship. The relationships are expressed in Table 12.
Table 12

School Type I: KY TECH ATC

<table>
<thead>
<tr>
<th>School Type: I KY TECH</th>
<th>N = 161</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Career Ready</td>
<td>Inst Imp</td>
</tr>
<tr>
<td>Instruction Implementation</td>
<td>0.33</td>
</tr>
<tr>
<td>Instruction Efficiency</td>
<td>0.28</td>
</tr>
<tr>
<td>Leader Implementation</td>
<td>0.36</td>
</tr>
<tr>
<td>Leadership Efficiency</td>
<td>0.33</td>
</tr>
<tr>
<td>Standard 3 Short Term</td>
<td>0.19</td>
</tr>
<tr>
<td>Standard 3 Long Term</td>
<td>0.25</td>
</tr>
<tr>
<td>Standard 7 Short Term</td>
<td>0.27</td>
</tr>
<tr>
<td>Standard 7 Long Term</td>
<td>0.26</td>
</tr>
</tbody>
</table>

*Note. N = 161. (p < .05).* Cronbach’s alpha reliabilities for each construct are identified by parentheses at the top of each column. The alpha results indicate a strong internal consistency among items in each scale.
The Pearson $r$ correlations were conducted on the second school type, locally-controlled career centers. The results revealed a moderate to strong positive relationship between instruction and leadership. A moderate to strong relationship also was found between Leadership Implementation and Leadership Efficiency. Table 13 reflects the findings.
Table 13

*School Type II: Locally-controlled Career Centers*

<table>
<thead>
<tr>
<th>School Type: II CTC N= 33</th>
<th>% Career Ready</th>
<th>Inst Impl</th>
<th>Inst Eff</th>
<th>Lead Impl</th>
<th>Lead Eff</th>
<th>St 3 Short</th>
<th>St 3 Long</th>
<th>St 7 Short</th>
<th>St 7 Long</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instruction Implement</td>
<td>0.11</td>
<td>(0.95)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instruction Efficiency</td>
<td>0.19</td>
<td>0.91</td>
<td>(0.95)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leadership Implement</td>
<td>0.24</td>
<td>0.51</td>
<td>0.41</td>
<td>(0.95)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Leadership Efficiency</td>
<td>0.31</td>
<td>0.54</td>
<td>0.51</td>
<td>0.97</td>
<td>(0.95)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard 3 Short Term</td>
<td>0.06</td>
<td>0.48</td>
<td>0.47</td>
<td>0.59</td>
<td>0.62</td>
<td>(0.97)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard 3 Long Term</td>
<td>0.07</td>
<td>0.49</td>
<td>0.43</td>
<td>0.61</td>
<td>0.62</td>
<td>0.79</td>
<td>(0.97)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard 7 Short Term</td>
<td>0.15</td>
<td>0.54</td>
<td>0.5</td>
<td>0.85</td>
<td>0.89</td>
<td>0.69</td>
<td>0.57</td>
<td>(0.97)</td>
<td></td>
</tr>
<tr>
<td>Standard 7 Long Term</td>
<td>0.12</td>
<td>0.51</td>
<td>0.44</td>
<td>0.81</td>
<td>0.81</td>
<td>0.63</td>
<td>0.54</td>
<td>0.82</td>
<td>(0.97)</td>
</tr>
</tbody>
</table>

*Note. N = 33. (p = .05). Cronbach’s alpha reliabilities for each construct are identified by parentheses at the top of each column. The alpha results indicate a strong internal consistency among items in each scale.*
Bivariate analyses were used to correlate the relationship between the CTE Programs in the comprehensive high school and the psychometric constructs. The results revealed a significant positive relationship between instruction and leadership for all variables in the comprehensive high school setting. Conversely, the correlation between instruction, leadership, and student achievement was weak. The results are expressed in Table 14.
Table 14

School Type III: Comprehensive High School CTE Program

<table>
<thead>
<tr>
<th>School Type: III HS CTE N = 45</th>
<th>%</th>
<th>Career Ready</th>
<th>Inst Imp</th>
<th>Inst Eff</th>
<th>Lead Imp</th>
<th>Lead Eff</th>
<th>St 3 Short</th>
<th>St 3 Long</th>
<th>St 7 Short</th>
<th>St 7 Long</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instruction</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Implementation</td>
<td>0.11</td>
<td>(0.95)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instruction Efficiency</td>
<td>0.19</td>
<td>0.94 (0.95)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leadership</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Implementation</td>
<td>0.24</td>
<td>0.67 0.7 (0.95)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leadership Efficiency</td>
<td>0.31</td>
<td>0.63 0.7 0.98 (0.95)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
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<td>Standard 3 Short</td>
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<td></td>
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</tr>
<tr>
<td>Term</td>
<td>0.06</td>
<td>0.53 0.51 0.65 0.65 (0.97)</td>
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<td></td>
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<td></td>
<td></td>
</tr>
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<td>Standard 3 Long</td>
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<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Term</td>
<td>0.07</td>
<td>0.56 0.64 0.76 0.78 0.89 (0.97)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
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<td></td>
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<td></td>
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</tr>
<tr>
<td>Term</td>
<td>0.15</td>
<td>0.54 0.55 0.81 0.8 0.62 0.7 (0.97)</td>
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<tr>
<td>Standard 7 Long</td>
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</tr>
<tr>
<td>Term</td>
<td>0.12</td>
<td>0.54 0.58 0.8 0.81 0.58 0.71 0.98 (0.97)</td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. N = 45. (p < .05). Cronbach’s alpha reliabilities for each construct are identified by parenthesis at the top of each column. The alpha results indicate a strong internal consistency among items in each scale.
The data analysis for this section combined Research Questions 2, 3, and 4, while controlling for CTE Teaching Experience. Bivariate correlations were utilized to examine relationships between psychometric constructs: Instruction Implementation, Instruction Efficiency, Leadership Implementation, Leadership Efficiency, Instruction Goals Short Term, Instruction Goals Long Term, Leadership Goals Short Term, and Leadership Goals Long Term. The analysis controlled for the demographic factor CTE Teaching Experience.

The years of experience were dichotomized into three categories. Category I included years 1 to 5, Category II involves years 6 to 11, and years 12 to 31 were classified as Category III. The first Pearson $r$ analysis revealed that Category I was statistically significant, with moderate to strong correlations between instruction, leadership, and years of teaching experience. The relationship between instruction and leadership and years of teaching experience was moderate to strong. The Percent of Career Ready student data was included, and the relationship was statistically significant. However, a weak correlational relationship was noted between Category I, psychometric variables, and Percent of Career Ready students. The full analysis is displayed in Table 15.
Table 15

**CTE Teachers with 1 to 5 Years of Teaching Experience**

<table>
<thead>
<tr>
<th>1 to 5 Years of Experience</th>
<th>%</th>
<th>Career Ready</th>
<th>Inst Imp</th>
<th>Inst Eff</th>
<th>Lead Imp</th>
<th>Lead Eff</th>
<th>St 3 Short</th>
<th>St 3 Long</th>
<th>St 7 Short</th>
<th>St 7 Long</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instruction Implement</td>
<td>0.25</td>
<td>(0.95)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instruction Efficiency</td>
<td>0.23</td>
<td>0.95</td>
<td>(0.95)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leadership Implement</td>
<td>0.34</td>
<td>0.77</td>
<td>0.74</td>
<td>(0.95)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leadership Efficiency</td>
<td>0.33</td>
<td>0.79</td>
<td>0.78</td>
<td>0.94</td>
<td>(0.95)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard 3 Short Term</td>
<td>0.18</td>
<td>0.67</td>
<td>0.63</td>
<td>0.73</td>
<td>0.77</td>
<td>(0.97)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard 3 Long Term</td>
<td>0.28</td>
<td>0.66</td>
<td>0.62</td>
<td>0.74</td>
<td>0.77</td>
<td>0.94</td>
<td>(0.97)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard 7 Short Term</td>
<td>0.33</td>
<td>0.59</td>
<td>0.59</td>
<td>0.86</td>
<td>0.81</td>
<td>0.62</td>
<td>0.63</td>
<td>(0.97)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard 7 Long Term</td>
<td>0.32</td>
<td>0.62</td>
<td>0.59</td>
<td>0.85</td>
<td>0.78</td>
<td>0.59</td>
<td>0.62</td>
<td>0.96</td>
<td>(0.97)</td>
<td></td>
</tr>
</tbody>
</table>

*Note. N = 45. (p < .05). Cronbach’s alpha reliabilities for each construct are identified by parentheses at the top of each column. The alpha results indicate a strong internal consistency among items in each scale.*
Bivariate analyses were used to correlate the relationship between Category II Teaching Experience, psychometric constructs, and the Percent of Career Ready students. The results revealed a significant positive relationship between Instruction and Leadership for teachers who were identified in Category II, Teaching Experience. While the relationship between Instruction, Leadership, and Percent of Career Ready students was statistically significant, the correlational relationship was weak. The results are displayed in Table 16.
**Table 16**

*CTE Teachers with 6 to 11 Years of Teaching Experience*

<table>
<thead>
<tr>
<th>6 to 11 Years of Experience</th>
<th>N= 74</th>
<th>Career Ready</th>
<th>Inst Imp</th>
<th>Inst Eff</th>
<th>Lead Imp</th>
<th>Lead Eff</th>
<th>St 3 Short</th>
<th>St 3 Long</th>
<th>St 7 Short</th>
<th>St 7 Long</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instruction Implement</td>
<td>0.28</td>
<td>(0.96)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instruction Efficiency</td>
<td>0.24</td>
<td>0.89</td>
<td>(0.96)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leadership Implement</td>
<td>0.24</td>
<td>0.54</td>
<td>0.55</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leadership Efficiency</td>
<td>0.25</td>
<td>0.48</td>
<td>0.56</td>
<td>0.95</td>
<td>(0.96)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard 3 Short Term</td>
<td>0.18</td>
<td>0.56</td>
<td>0.53</td>
<td>0.38</td>
<td>0.32</td>
<td>(0.96)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard 3 Long Term</td>
<td>0.86</td>
<td>0.51</td>
<td>0.59</td>
<td>0.47</td>
<td>0.45</td>
<td>0.82</td>
<td>(0.96)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard 7 Short Term</td>
<td>0.17</td>
<td>0.35</td>
<td>0.42</td>
<td>0.79</td>
<td>0.82</td>
<td>0.26</td>
<td>0.41</td>
<td>(0.96)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard 7 Long Term</td>
<td>0.21</td>
<td>0.37</td>
<td>0.48</td>
<td>0.77</td>
<td>0.82</td>
<td>0.26</td>
<td>0.48</td>
<td>0.94</td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

*Note. N = 74. (p = < .05).* Cronbach’s alpha reliabilities for each construct are identified by parentheses at the top of each column. The alpha results indicate a strong internal consistency among items in each scale.
A final Pearson $r$ correlation was performed on Category III Teaching Experience. The data analysis revealed statistically significant relationships between Instruction Implementation and Instruction Efficiency, Leadership Implementation and Leadership Efficiency, Instructional Goals Short Term and Instructional Goals Long Term, and Leadership Goals Short Term and Leadership Goals Long Term. The correlations between psychometric variables and Category III Teaching Experience were moderate to strong. The correlation between Category III and the Percent of Career Ready students was statistically significant, with a weak relationship. The data analysis is presented in Table 17.
Table 17

*CTE Teachers with 12 Years or More Teaching Experience*

<table>
<thead>
<tr>
<th>CTE Teaching Experience: 12 Years or More</th>
<th>Career Ready</th>
<th>Inst Imp</th>
<th>Inst Eff</th>
<th>Lead Imp</th>
<th>Lead Eff</th>
<th>St 3 Short</th>
<th>St 3 Long</th>
<th>St 7 Short</th>
<th>St 7 Long</th>
</tr>
</thead>
<tbody>
<tr>
<td>N = 85</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instruction Implement</td>
<td>0.09</td>
<td>(0.95)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instruction Efficiency</td>
<td>0.05</td>
<td>0.88</td>
<td>(0.95)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leadership Implement</td>
<td>0.27</td>
<td>0.48</td>
<td>0.44</td>
<td>(0.95)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leadership Efficiency</td>
<td>0.25</td>
<td>0.43</td>
<td>0.48</td>
<td>0.95</td>
<td>(0.95)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard 3 Short Term</td>
<td>0.28</td>
<td>0.35</td>
<td>0.35</td>
<td>0.54</td>
<td>0.55</td>
<td>(0.95)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard 3 Long Term</td>
<td>0.22</td>
<td>0.36</td>
<td>0.35</td>
<td>0.56</td>
<td>0.57</td>
<td>0.83</td>
<td>(0.95)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard 7 Short Term</td>
<td>0.21</td>
<td>0.44</td>
<td>0.46</td>
<td>0.75</td>
<td>0.75</td>
<td>0.7</td>
<td>0.64</td>
<td>(0.95)</td>
<td></td>
</tr>
<tr>
<td>Standard 7 Long Term</td>
<td>0.15</td>
<td>0.4</td>
<td>0.4</td>
<td>0.73</td>
<td>0.72</td>
<td>0.66</td>
<td>0.6</td>
<td>0.92</td>
<td>(0.95)</td>
</tr>
</tbody>
</table>

*Note.* $N = 74$. ($p = <.05$). Cronbach’s alpha reliabilities for each construct are identified by parentheses at the top of each column. The alpha results indicate a strong internal consistency among items in each scale.
Summary

The current study examined the psychometric constructs and relationships that may exist based on identified demographic factors. The School Type, Education Level, and Years of Experience were utilized to determine relationships. The t-test revealed no significant difference between teachers who participated in the NTI and those who did not. An ANOVA was utilized to examine Research Question 1. The ANOVA was calculated by School Type, Education Level, and CTE Teaching Experience. The data analysis of the ANOVA reflected no significant differences in most of the variables. The percent of career ready students was significant in all three areas, $F = 18.72, p = < .0001$. Short-Term Leadership Goals was significant in the Education Level ($F = 2.4, p = .05$) and $CTE$ Teaching Experience ($F = 2.4, p = .05$) categories, respectively.

The remaining three Research Questions were combined and analyzed utilizing the Pearson $r$. Individual correlations were performed by each School Type. The results revealed that all schools types were statistically significant, and moderate to strong positive relationships existed among psychometric constructs. Correlations also were performed to determine relationships between CTE teaching experience and the psychometric constructs. The data were statistically significant, with a moderate to strong relationship among the variables. Conversely, results exposed weak positive relationships between all variables and the percent of students identified as career ready.

The current study suggested a positive relationship between instruction and leadership, as analyzed by the three types of schools and teaching experience in the CTE setting. Conversely, the relationship between the psychometric variables (Leadership and Instruction) was weak, igniting additional questions. The findings revealed an
opportunity for further studies concerning student achievement and instruction in the CTE setting, student achievement and leadership in the CTE setting, and student achievement by school type. Chapter V will discuss the implications of these results.
CHAPTER V: DISCUSSION AND CONCLUSIONS

The previous chapters have introduced the role of CTE in Kentucky’s public education system, the CCR Model, and the need for instructional leadership in the CTE system. This chapter will present an overview of the study, provide interpretations of key outcomes, discuss results for each research question, reveal limitations of the study, discuss recommendations for future research, and summarize conclusions for the study.

KDE adopted the SISI as the primary guideline in the public school system for student success (KDE, 2004d). The 9 Standards and 88 Indicators established guidelines for successful schools and student achievement. KDE created the Scholastic Audit to determine the level of implementation for the SISI. High performing schools were rewarded and low performing schools were selected for audit. The Scholastic Audit was expensive, imposing, and lasted up to one week, which became disruptive to the educational process. Due to these factors, the Scholastic Audit was eliminated, but KDE needed a way to evaluate school progress on SISI.

Study in Brief

As mentioned in previous chapters, the SISI provided a guiding framework for whole school reform. The SISR was an assessment tool developed utilizing the 9 Standards and 88 Indicators identified in the SISI document. Miller et al., (2013) suggested the enhanced SISR version as a valid evaluation tool for school improvement in the traditional high school setting. The current study utilized the SISR survey in the CTE setting to measure Leadership (Standard 7) and Instruction (Standard 3) through teacher perceptual scales (Miller et al., 2013). The investigation utilized demographic control factors along with the SISR to compare influences of selected standards of the
SISR on student achievement. Central to the study was the role of leadership in CTE schools.

In an effort to better prepare students for the demands of a global economy, KDE introduced a CCR Model. The new accountability model measures traditional academic schools, locally controlled career centers, and KY TECH ATCs based on the number of students who are classified as college ready, career ready, or college and career ready.

In this chapter, implications of the research will be discussed with a discussion of the results of the statistical analyses. The research will explain the results as they relate to the Research Questions, synthesize the key findings, identify implications for changes in policy at the state level, and explore targets for future research. Potential relationships between Leadership and Instruction in the CTE setting were identified as determined by School Type, Education Level, Years of Experience, and Teacher Preparation Program. The SISR provided the psychometric variables and teacher perceptual scales for analyses.

**Demographic Factors**

Descriptive statistics were reported for School Type, School Location, Gender, Education Level, Career Cluster, Position, Years of Experience, and the Teacher-Preparation Program. Results indicated that KY TECH ($N = 146$) were responsible for 58.63% of participants, locally controlled career centers ($N = 33$) represented 13.25% of participants, and comprehensive high school CTE programs ($N = 70$) represented 28.11% of the initial participants in the SISR. The gender variable indicated 99 (39.76%) were female and 150 (60.24%) were male participants. While a higher response rate was expected, the imbalance in results led to the removal of the variable for statistical analyses. However, the gender demographic factor was relevant to the study to identify
the number of females in CTE and expose the need for further research concerning recruitment activities surrounding female students in CTE, which leads to female teachers in CTE.

Winkler (2012) asserted that CTE is similar across the Commonwealth by School Type, there are varying degrees of governance and policy enforcement. Additionally, leadership implementation and efficiency as measured by Student Achievement in each school setting varies significantly. It is argued that CTE programs in the KY TECH system place a higher significance on career readiness than in other CTE settings and maintains a stronger relationship with the business and industry they support. The partnerships require students to achieve career ready status. Kinesthetic learners are drawn to these programs and in some cases excel in the CTE environment, encouraging lower level students to realize career readiness certifications and successful transitions into the world of work (Arnold, 2013). The current study revealed that KY TECH exhibited a significantly larger number of career ready students suggesting that the assumptions about the career focus in the KY TECH setting were accurate. While the School Type variable revealed a significant difference in Student Achievement between school settings, the study did not explain why the KY TECH system was elevated.

The Career Cluster variable findings exposed a relatively even distribution across the Career Clusters. Conversely, a large percentage of participants did not identify a Career Cluster area. The frequency data missing \((N = 51)\) rendered the data ineligible for analysis. One possible explanation for the missing responses suggests the Career Cluster question narrowed the program selection by school providing enough information to determine the identity of the participant.
In an effort to determine if there was a difference in responses based on the Teacher Preparation Program, a $t$-test was performed to compare mean scores of teachers who participated in the NTI experience and those who attended a four-year formal Teacher Preparation Program. For this section, it is important to re-present the findings of the $t$-test. The results of the independent $t$-test were not significant for most of the teacher perceptual scales: ($N = 239$), Instruction Implementation ($t = .32$), Instruction Effectiveness ($t = .57$), Leadership Implementation ($t = .25$), Leadership Effectiveness ($t = .60$), Leadership Short-Term ($t = .28$), and Leadership Long-Term ($t = .38$) indicating there is no significant difference in responses between CTE teachers who attended NTI ($N = 143, M = 3.79$) and those who did not ($N = 96, M = 3.71$). However, the Instruction Goals Short-Term ($t = .04$) and Instruction Goals Long-Term ($t = .034$) were found to be significant indicating a considerable difference between teachers who attended NTI ($M = 4.06$) and teachers who did not attend NTI ($M = 3.8$).

The results exposed no significant difference between teachers who attend a four-year formal Teacher Preparation Program at a university and teachers who attend the week-long intensive teacher training program offered through OCTE. The results reported indicate that CTE teachers who begin their teaching career with work experience in their career pathway and participate in the two-year Teacher Preparation Program through the Associate’s Degree, view Instruction, Leadership, and school improvement consistently with teachers who participated in the formal four-year Teacher Preparation Program. An explanation for this may lie in the fact that the fundamental tenants of teaching are condensed into the NTI experience and tradesmen who are entering the CTE teaching arena are motivated to share their skill sets with the youth they teach. In

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addition, it is possible that the CTE work experience requirement attracts teachers with more real life proficiency and possibly supervisor or training involvement prior to accepting a teaching position.

The data analyses of the principal’s approach to improving Instruction Short-Term Goals and Instruction Long-Term Goals were significantly different when compared to the Teacher Preparation Program of participants. The results revealed that teachers indicated the support of daily instruction and teaching strategies was implemented well and the follow-up efforts to support the instruction was effective. Conversely, teachers specified the implementation and follow-up support of the Long-Term Goals for Instruction were inadequate, suggesting that long-term planning for professional development and the execution of the long-term school improvement plan were ineffective. One explanation could be the lack of instructional leadership by principals in the traditional and CTE setting. It could be argued that the investment of time to implement the new CCR Model has restricted visionary leadership. Further research would be required to determine potential factors influencing the variables. Table 7 provides a depiction of the results.

The Years of Experience on the SISR were indicated by the individual year. The combination of years 1-5 represented 32.13%, years 6-11 signified 28.91%, and years 12-31 or more characterized 35.73% of the respondents. The majority of participants reported 10 years or less (61.12 %) Teaching Experience and 9.64% reported 20 years or more of Teaching Experience. The results reflected that Teaching Experience had little to no influence on teacher perceptions concerning the impact of Leadership on Instruction. Similar to the current study, Sahin (2011) conducted a study on 16
Curriculum Laboratory Schools in Izmir, Turkey to determine the relationship between instructional leadership and a positive school culture and school improvement. While the teachers reported that instructional leadership was critical to a positive culture, teaching experience and age had no significance in the results for that study. The results in the current study indicated a younger population of CTE teachers, suggesting CTE teachers with more experience are retiring or leaving the field prematurely. The OCTE and KDE merged in 2012 creating a systemic restructuring. The change was initially resisted by CTE teachers and principals which resulted in an elevated turnover rate for employees in the KY TECH System (Arnold, 2013). Van Dam, K., Oreg, S., and Schyns, B. (as cited by Dunican, 2015) argued “Tenure is significantly related to resistance to change.” Employees who have worked for a company longer invest in homes and retirement options. Their time with a company provides a sense of security and they feel vested and view change as a threat.

The current study reduced the initial independent variables and included Education Level, Teacher Preparation Program, Teaching Experience, Content Area, and School Type. The dependent variable was Student Achievement, which combined Work Keys scores, KOSSA scores, Industry Certifications, and Career Readiness. After further reviewing data analysis results, the Student Achievement variables were dependent on each other revealing the need to combine the factors into a single Career Ready category. The final number of Career Ready by school was calculated based on the number of eligible preparatory seniors in each building to determine the student achievement percentage for the individual school.

It is important to note that the average total population of students in the KY
TECH schools was close to 250 students. The average population of students in the traditional high school was 850. While there was a significant imbalance in the total student population, the number of preparatory students in a CTE area was similar when comparing schools. Therefore, the calculations were averaged on similar totals even though the total population was significantly different. These findings suggest the same emphasis is not placed on career readiness in the traditional high school as in the KY TECH system. Further research is required to confirm these findings.

The Research Questions guided the analyses of the influence of demographic factors and bivariate correlations among Standard 7 (Leadership), Standard 3 (Instruction), and the Career Ready measures. For the current study, the SISR teacher perceptual scales 1-24 and 45-68; psychometric scales 1-24 and 45-68 Efficiency; Instruction Short-Term and Long-Term Goals; and Leadership Short-Term and Long-Term Goals were considered.

**Discussion of Research Question 1**

*To what degree do demographic factors relate to teacher perceptions of the Standard 7 (Leadership), Standard 3 (Instruction), and the Career Readiness Accountability Measures in Kentucky?*

The first Research Question examined the influence of demographic factors on Standard 7 (Leadership), Standard 3 (Instruction), and the career readiness measures. Three separate ANOVAs were calculated to determine differences in teacher perceptual scales and psychometric constructs based on the demographic factors, School Type, CTE Teaching Experience, and Education Level.

Perry and Wallace (2012) identified four CTE School Types: Career Academies,
Technical Education Programs, Early College Models, and School Based Enterprise. The School Types for the current study were selected from the Technical Education Programs category. An ANOVA was utilized to identify differences between the mean of the School Types \( p = < .05 \). For most of the variables, no significant differences were indicated, suggesting that teachers in each of the CTE settings responded similarly on the teacher perceptual scales regarding instruction, instructional leadership, and leadership by CTE principals. The results suggested that Leadership has a significant impact on Instruction, which is supported by other studies (Blase and Blase, 2000; Costellow, 2011; Sahin, 2011).

The ANOVA was conducted on the Educational Level demographic variable. The results indicated “no significant difference” between variables. At first glance, these results seem insignificant; however, the key finding is the lack of significance between Educational Levels. The Education Level results revealed that 33% identified an Associate’s Degree or less, 54% maintained a B. S. Degree, and 42% reported a Master’s Degree or higher; yet, there were no significant differences among the groups. The findings revealed that CTE teachers with less than an Associate’s Degree responded similarly to those with a Doctorate degree concerning the impact of leadership on instruction in the CTE setting. CTE teachers, regardless of Education Level, indicated that instructional leadership is important to instruction and ultimately, important to school improvement.

The second ANOVA attempted to narrow the findings by Teaching Experience. The results revealed no significant difference based on Teaching Experience among School Types. Over 60% of CTE teaches reported 10 years or less Teaching Experience.
The similar responses suggest that younger teachers have the same expectations for Instruction and Leadership in the CTE setting. However, less than 10% of respondents reported over 20 years of Teaching Experience with similar replies suggesting that the Years of Experience do not impact the teacher perceptions concerning the mediated effect of Leadership on Instruction. Similar to the current study, Sahin (2011) conducted a study to determine the relationship between instructional leadership and a positive school culture and school improvement. While the teachers in the current study reported that instructional leadership is critical to a positive culture, Teaching Experience and age had no significance in the results. Interestingly, the results expressed a significant difference in the student achievement variable. KY TECH schools reflected a significantly higher number of students who were career ready. While CTE teacher experience exposed no significant difference between categories, there is no explanation for the difference in student achievement.

The third ANOVA focused on the Education Level of respondents by School Type. The report results disclosed no significant difference among School Types. The Education Level varied significantly among School Types. However, the responses reflected no significant differences in responses. The student achievement variable continued to show a significant difference in career readiness.

The results of the ANOVAs reflected no significant differences in responses, which suggests the mean scores between School Types were consistent concerning Teacher Preparation Program, Education Level, and Teaching Experience. KY TECH, which has the lowest Education Level, reported the highest number of career ready students. In addition, the results suggested that CTE teachers may perceive disconnects
between the principal’s initiating an instructional strategy and the professional
development to sustain support of the strategy for the long term. However, further
research is necessary to determine psychometric factors impacting the student
achievement levels by School Type. Further analysis of instructional leadership would
be beneficial to understanding disconnects between implementing a teaching strategy and
sustaining the strategy.

**Discussion of Research Question 2**

*To what degree does Standard 7 (Leadership) relate to Standard 3 (Instruction) and Career Readiness Accountability Measures in Kentucky?*

The second Research Question examined the impact of leadership on instruction and student achievement. Ennis (2007), McKinney (2007), and Todd (2010) performed similar studies utilizing the SISI as a guiding framework and exposed that leadership has a significant influence on instruction. The Pearson $r$ was utilized to evaluate the correlations between the teacher perceptual scales, psychometric scales, and Student Achievement. In an effort to identify relationships among schools, Pearson $r$ was utilized to compare data by School Type. The results uncovered similar findings. CTE teachers across the three School Types reported a strong correlation between Leadership and Instruction. A weak correlation was reported between Leadership and Student Achievement; however, even this weak correlation verifies a relationship between the two. This finding conflicted with similar research studies concerning instruction, leadership, and school improvement (Bass & Bass, 2008; Leithwood, 1990; Lucas & Valentine, 2002; Manders, 2008; Marzano et al., 2005; Northouse, 2012).

The findings suggested that the relationship between Leadership and Instruction
was important to school improvement in the CTE setting but was not the determining factor for Student Achievement. Blase and Blase (2000) asserted that transformational leadership has a positive impact on instruction and school improvement. The weak relationship between leadership and student achievement could be explained by the leadership styles or behaviors practiced in the CTE setting. Sahin (2011) asserted that culture and climate are critical components of student achievement and school improvement. Further research to explore these variables and to identify other factors that may influence Student Achievement would be relevant for the CTE system.

Discussion of Research Question 3

To what degree do Standard 7 (Leadership) and Standard 3 (Instruction) relate to Career Readiness Accountability Measures in Kentucky?

The third Research Question explored the impact of Standard 7 (Leadership) and Standard 3 (Instruction) on student achievement. The Pearson $r$ was utilized to examine the correlations among the variables by School Type. The results revealed that the relationship was statistically significant. The results found on the teacher perceptual scales and psychometric scales challenge the traditional educational perception that there is a strong correlation among instruction, leadership, and student achievement. When the research was expanded to determine the relationship as it relates to Student Achievement, the relationship was there but weak. These findings are in contrast to similar research findings (Barker, 2007; Blase & Blase, 2000; Manasse, 1985; Quinn, 2002; Reeves, 2002; Sahin, 2011), which affirm a direct correlation among Leadership, Instruction, and Student Achievement or school improvement.

A broader study to include teacher perceptual scales regarding culture would
provide a deeper insight into the current topic. Sahin (2011) argued that culture has a
significant impact on student achievement. Costellow (2011) asserted that
transformational leadership has a significant impact on instruction and student
achievement. Further analysis of principals and principal perceptions concerning
leadership styles in the CTE setting reveal discrepancies between leadership styles and
behaviors practiced in the CTE setting.

Discussion of Research Question 4

To what degree does Standard 3 (Instruction) mediate the effect of Standard 7
(Leadership) on the Career Readiness Measures in Kentucky, controlling for
demographic factors?

Last, the fourth Research Question analyzed the mediated effect of Leadership on
Instruction and ultimately Student Achievement. For the analyses, Instructional
Implementation and Instructional Efficiency and Leadership Implementation and
Leadership Efficiency were considered by School Type. The analyses revealed that all
School Types supported a moderate to strong relationship between Leadership
Implementation and Leadership Efficiency, and Instructional Implementation and
Instructional Efficiency. Likewise, the results revealed a relationship (though weak)
between Short-Term Instructional Goals and Long-Term Instructional Goals. The
findings indicated that principals support initial teaching strategies but do not provide the
professional development necessary to sustain the initiative for the long-term as
presented in the data. Surprisingly, the relationship between Leadership and Student
Achievement was weak, bringing into question, at least in the CTE setting, how much
instructional leadership directly impacts Student Achievement. The findings have
significant implications for professional development planning, financial budgeting of initial costs, return on investment considerations, and school culture. While there was no direct correlation to Student Achievement, there may be affective influences on Student Achievement that were not measured in the current study. A stronger relationship between these variables was anticipated.

**Implications for Policy and Practice**

The first implication for policy involves the SISR instrument. In the current study, the SISR was successfully utilized to evaluate CTE by School Type, Education Level, Teacher Preparation Program, Teaching Experience, Content Area, and Student Achievement. Miller et al. (2014) asserted that the instrument was a valid and reliable instrument to measure school improvement based on the SISI framework. While the OCTE utilizes the Program Assessment process to evaluate programs, the SISR may serve as an enhancement to the process. The Program Assessment incorporates a site visit every two years. The SISR could be utilized in the years with no site visit to evaluate schools utilizing the teacher perceptual scales and psychometric scales. The findings could be incorporated into the Program Assessment and school improvement process.

The second implication for policy is the discrepancy between implementation of instructional initiatives and the Long-Term maintenance of the initiatives. The results reveal teacher perceptions that principals do a good job of initiating instructional programs or instructional strategies for the building. However, continuous support of the programs or initiatives is ineffective. Marzano et al. (2005) asserted that the implementation of a successful program requires buy-in from 80% of the teachers,
purpose, and persistent professional development to support the program. The teacher perceptions imply that CTE schools need to improve professional development to support instructional initiatives for the building and be more intentional in the selection process for improving instruction. These findings were similar across the School Types. Therefore, a state-wide program originating from the OCTE would be important.

The final implication for policy is the significant difference in the Student Achievement variable. While the current study revealed the School Type as the variable indicating higher levels of Student Achievement, the data analyses did not expose variables to explain the levels of Student Achievement by School Type. The demographic variables of School Type, Education Level, Teaching Experience, and Teacher Preparation Program were analyzed to determine factors influencing Student Achievement. However, the current study did not explain why the variables did not reflect a stronger correlation with student achievement. In an effort to improve practices supporting Student Achievement, a system-wide study would support a change in policy surrounding the CTE approach to Career Readiness. The systemic approach to understanding Student Achievement by School Type would provide insight into the factors supporting school improvement. A qualitative study of the top five performing schools by School Type could possibly garner significant data for consideration.

**Limitations**

A foundational component of research is the limitations or restrictions imposed on any study. The notion that a particular topic can be exhausted through research is unrealistic. It is essential to recognize that the current study incorporated a correlational
design in the CTE setting. To the author’s knowledge, there is minimal research surrounding Career and Technical Education and school improvement in Kentucky.

One limitation of the current study was the construct of the SISR, which was designed to measure SISI standards as implemented in the traditional academic setting. The SISR document incorporated a two column approach with a 5-point Likert scale for each response in each column. The thorough approach yielded extensive data. However, the approach created over 150 response items, challenging the tenacity of the respondents. In addition to the length and design, the OCTE utilizes the AdvancEd standards as a framework for whole-school improvement. Principals and central office leadership questioned why the research utilized the SISI. While the Program Assessment and Scholastic Audit are similar, no direct correlation exists between the two assessment models. The SISR was utilized to measure teacher perceptions in the CTE setting. While the majority of the questions were universal, CTE teachers viewed some of the questions as irrelevant to their content area.

A second limitation of the study was the imbalance in responses. The data were collected through three venues: KY TECH ATCs, locally controlled career centers, and high school CTE programs. Due to Winkler’s (personal communication, July 18, 2013) support, the response rate for the ATC’s was much higher than the locally controlled career centers and comprehensive high school CTE programs. The variances resulted in a larger number of KY TECH participants. A random sample from this group was utilized for pairing purposes with the other two settings. As a result, possibly meaningful data were discarded.
A third limitation for the study was the distribution design. The paradigm for the SISR was a distribution to principals who would administer the instrument to teachers during a faculty meeting. Principals are overwhelmed with daily duties and the SISR was not a priority. Due to a low response rate, the SISR was later distributed directly to teachers with instructions for completing the SISR. After the direct contact with teachers, the number of participants increased by 32%.

A fourth limitation was the incomplete or incorrect data provided on the instrument. Multiple surveys were discarded due to incomplete or detracting information. Some participants declined to include the career cluster. This information could have identified them in their building. As a result, their surveys were utilized but the career cluster data was discarded.

A last limitation was the number of comprehensive high school districts agreeing to participate in the study. Over one third of school districts declined to return the signature form to participate in the study. While the number of comprehensive high school CTE programs was higher than locally controlled career centers, the overall participation rates could have been significantly higher with stronger support from the central office staff.
**Recommendations for Further Research**

The current study used the SISI to explore the relationships among Leadership, Instruction, and Student Achievement. The results reflected moderate to strong relationships between Leadership and Instruction. However, student achievement could be linked to School Type only. With a limited number of participants, the results indicated a need for further research concerning Career and Technical Education. A psychometric analysis of School Type and Student Achievement rates by school would provide deeper insight into the constructs supporting school improvement and student achievement in the CTE setting.

The data analysis revealed disconnects between Instructional Short-Term Goals and Instructional Long-Term Goals in all three School Types. Further research to examine the paradigm surrounding instructional program implementation and the professional development to support the program for the long-term would be relevant. The financial investment for new programs can be significant. A new program without the professional development for teachers to support the program may be detrimental to the educational process. The similar finding in all School Types implies that there exist system level disconnects concerning professional development and the support of long-term goals for CTE. Additional research may help identify growth areas to close the gap.

The current study concentrated on teacher perceptual scales and psychometric scales for teachers in the CTE setting. A natural progression would be an analysis of principal perceptual scales concerning Instruction, Leadership, and Student Achievement. The variables would include a section to elicit data concerning the principals’ perception of their own leadership and leadership behavior that is most effective in the CTE setting.
The study could expand to include principals in the traditional high school setting. A t-test to analyze differences in perceptions and leadership styles would provide valuable information to trainers in the NTI cadre and to professors in the university principal preparation programs. The paradigms surrounding CTE principals and traditional principals would provide insight for the enhancement of formal preparation programs.

If the current study were to be replicated, a two-way ANOVA and additional t-tests would yield deeper insight into the relationships among additional factors. Presenting the study at a state Superintendent’s meeting with the support of the Commissioner of KDE would garner more support for the study. Conducting the study with each school type individually would provide a stronger focus and richer data. The findings could then be compared through statistical analysis.

**Conclusions**

KDE introduced CCR Model in 2011. The new accountability model required CTE students to meet benchmarks for the ACT, Work Keys, and earn a KOSSA or Industry Certificate in a chosen career pathway to be classified as College or Career Ready. This initiative elevated career and technical education across the commonwealth. However, as the expectations for CTE became more prevalent in KDE’s traditional education system, growth areas were evident (Holliday, 2012). The need for instructional leadership and the integration of math, science, and English in the CTE content areas were necessary. The increased demand forced central office staff in the OCTE to introduce innovative systemic initiatives to address the deficiencies (Winkler, 2012).

The current study provided the following conclusions: (a) Demographic Factors have a significant effect on Leadership and Instruction; (b) School Type has a significant
correlation with Student Achievement; (c) Instruction is statistically significant with Student Achievement; (d) Leadership is statistically significant with Student Achievement; (e) Leadership has a significant direct effect on Instruction; (f) Leadership has a significant mediated effect and moderate to strong relationship with Instruction; (g) Teachers with less than an A.S. Degree or an A.S. Degree possessed higher Student Achievement rates; (h) Teachers with less than an Associate’s Degree and teachers with a Doctorate Degree responded similarly regarding instruction, instructional leadership, and Leadership in the CTE setting; and (I) Type of Teacher Preparation Program did not reflect a significant difference in responses.

While the SISR had not been used to evaluate Leadership and Instruction in CTE schools, the SISR provided a persuasive instrument for measuring the 9 SISI Standards in the CTE setting. The current study yielded significant results concerning the relationship among Leadership, Instruction, and Student Achievement in CTE. The SISR will be recommended as a potential tool to evaluate CTE programs across Kentucky. The CCR Model in Kentucky created challenges for CTE. Hence, the OCTE introduced multiple initiatives to address increased instructional leadership and programs to transition CTE schools to be successful in the accountability model. As CTE continues to implement systemic change to address the fluid demands of CCR, intentional research to determine the quality of the initiatives and the impact they may have on students would be critical to the success of CTE in the CCR Model for Kentucky.
REFERENCES


doi:10.1080/09243450601058618


doi:10.1080/135943299398410


APPENDIX A

Standards and Indicators for School Improvement

The Nine Standards

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

Curriculum 1.1

Indicator 1.1a: There is evidence that the curriculum is aligned with the Academic Expectations, Core Content for Assessment, Transformations and the Program of Studies.

Indicator 1.1b: The district initiatives and facilitates discussions among schools regarding curriculum standards to ensure they are clearly articulated across all levels (P-12).

Indicator 1.1c: The district initiates and facilitates discussions between schools in the district in order to eliminate unnecessary overlaps and close gaps.

Indicator 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.)

Indicator 1.1e: The school curriculum provides specific links to continuing education, life and career options.

Indicator 1.1f: There is in place a systematic process for monitoring, evaluation and reviewing the curriculum.
Indicator 1.1g: The curriculum provides access to a common academic core for all students.

**Standard 2:** The school utilizes multiple evaluation and assessment strategies to continuously monitor and modify instruction to meet student needs and support proficient student work.

**Evaluation/Assessment 2.1**

Indicator 2.1a: Classroom assessments of student learning are frequent, rigorous and aligned with Kentucky’s core content.

Indicator 2.1b: Teachers collaborate in the design of authentic assessment tasks aligned with core content subject matter.

Indicator 2.1c: Students can articulate the academic expectations in each class and know what is required to be proficient.

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

Indicator 2.1e: Multiple assessments are specifically designed to provide meaningful feedback on student learning for instructional purposes.

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

**Instruction 3.1**

Indicator 3.1a: There is evidence that effective and varied instructional strategies are used in all classrooms.
Indicator 3.1b: Instructional strategies and learning activities are aligned with the district, school and state learning goals, and assessment expectations for student learning.

Indicator 3.1c: Instructional strategies and 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.

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

Indicator 3.1e: There is evidence that teachers incorporate the use of technology in their classrooms.

Indicator 3.1f: Instructional resources (textbooks, supplemental reading, technology are sufficient to effectively deliver the curriculum.

Indicator 3.1g: Teachers examine and discuss student work collaboratively and use this information to inform their practice.

Indicator 3.1h: There is evidence that homework is frequent and monitored and tied to instructional practice.

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

School Culture 4.1

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

Indicator 4.1c: Teachers hold high expectation for all students academically and behaviorally, and this is evidenced in their practice.

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

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

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

Indicator 4.1g: Teachers communicate regularly with families about individual student’s progress (e.g., engage through conversation).

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

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

Indicator 4.1j: There is evidence that student achievement is highly valued and publicly celebrated (e.g., displays of student work, assemblies).
Indicator 4.1k: The school/district provides support for the physical, cultural, socio-economic, intellectual needs of all students, which reflects a commitment to equity and an appreciation of diversity.

Standard 5: 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.

Student, Family, Community Support Program/Services 5.1

Indicator 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.

Indicator 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).

Indicator 5.1c: The school/district provides organizational structures and supports instructional practices to reduce barriers to learning.

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

Indicator 5.1e: The school maintains an accurate student record system that provides timely information pertinent to the student’s academic and educational development.
Standard 6: 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.

Professional Development 6.1

Indicator 6.1a: There is evidence of support for the long-term professional growth needs of the individual staff members. This includes both instructional and leadership growth.

Indicator 6.1b: The school has an intentional plan for building instructional capacity through on-going professional development.

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

Indicator 6.1d: Plans for school improvement directly connect goals for student learning and the priorities set for the school and district staff development activities.

Indicator 6.1e: Professional development is on-going and job-embedded.

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

Professional Growth and Evaluation 6.2

Indicator 6.2a: The school/district provides a clearly defined evaluation process.
Indicator 6.2b: Leadership provides the fiscal resources for the appropriate professional growth and development of certified staff based on identified school needs.

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

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

Indicator 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.

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

**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.**

Leadership 7.1

Indicator 7.1a: Leadership has developed and sustained a shared vision.
Indicator 7.1b: Leadership decisions are focused on student academic performance and are data-driven and collaborative.

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

Indicator 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 schools plan.

Indicator 7.1e: Leadership ensures 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.

Indicator 7.1f: Leadership insures that time is protected and allocated to focus on curricular and instructional issues.

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

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

7.1i: Leadership provides a process for the development and the implementation of council policy based on anticipated needs.
7.1j: There is evidence that the School Based Decision Making council has an intentional focus on student academic performance.

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

**Standard 8**: There is evidence that the school is organized to maximize use of all available resources to support high student and staff performance.

Organization of the School 8.1

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

Indicator 8.1b: The master class schedule reflects all students have access to all of the curriculum.

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

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

Indicator 8.1e: Staff promotes team planning vertically and horizontally across content areas and grade configurations that I focused on the goals, objectives, and strategies in the improvement plan (e.g., common planning time for content area teachers; emphasis on learning time and not seat time; and integrated units.
Indicator 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 developmental needs of students, interdisciplinary units, etc.).

Resource Allocation and Integration 8.2

Indicator 8.2a: The school/district provides a clearly defined process (in accordance with the school council allocation formula) to provide equitable and consistent use of fiscal resources.

Indicator 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 consider appropriate data.

Indicator 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.

Indicator 8.2d: State and federal program resources are allocated and integrated (Safe Schools, Title I, Individuals with Disabilities Education Act, Family Resource/Youth Services Centers, Extended School Services) to address student needs identified by the school/district.

Standard 9: 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.
Defining the School’s Vision, Mission, and Beliefs 9.1

Indicator 9.1a: There is evidence that a collaborative process was used to develop the vision, beliefs, mission, and goals that engage the school community as a community of learners.

Development of the Profile 9.2

Indicator 9.2a: There is evidence the school/district planning process involves collecting, managing, and analyzing data.

Indicator 9.2b: The school/district uses data for school improvement planning.

Defining Desired Results for Student Learning 9.3

Indicator 9.3a: School and district plans reflect learning research, current local, state, and national expectations for student learning and are reviewed by the planning team.

Indicator 9.3b: The school/district analyzes their students’ unique learning needs.

Indicator 9.3c: The desired results for student learning are defined.

Analyzing Instructional and Organizational Effectiveness 9.4

Indicator 9.4a: Perceived strengths and limitations of the school/district instructional and organizational effectiveness are identified using the collected data.

Indicator 9.4b: The school/district goals for building and strengthening the capacity of the school/district instructional and organizational effectiveness are defined.
Development of the Improvement Plan 9.5

Indicator 9.5a: The action steps for school improvement are aligned with the school improvement goals and objectives.

Indicator 9.5b: The plan identifies the resources, timelines, and persons responsible for carrying out each activity.

Indicator 9.5c: The means for evaluating the effectiveness of the improvement plan are established.

Indicator 9.5d: The improvement plan is aligned with the school’s profile, beliefs, mission, desired results for students learning and analysis of instructional and organizational effectiveness.

Implementation and Documentation 9.6

Indicator 9.6a: The plan is implemented as developed.

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

Indicator 9.6c: The school evaluates the degree to which it achieves the expected impact on classroom practice and student performance specified in the plans.

Indicator 9.6d: There is evidence of attempts to sustain the commitment to continuous improvement.
APPENDIX B

Standards and Indicators for School Improvement (Revised)

Each of the nine standards with its corresponding set of indicators follows. The standards reflect any new names and/or rewording of the content inherent in each, as compared to the original Standards and Indicators for School Improvement. The revisions to the indicators (final set of 63 after analysis of the Pilot 2 data), include current wording of the SISR and represent the finalized version of the SISIR.
Academic Performance (Standards 1-3)

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

1.1. The curriculum (elementary, middle, or high) prepares students for eventual success in Advanced Placement (AP) and college level courses.

1.2. The curriculum provides rigorous exposure to advanced math and science content.

1.3. Curriculum standards are systematically monitored for vertical alignment across grade levels and school transitions.

1.4. The curriculum provides equal access to rigorous standards and learning expectations for students from all groups/backgrounds.

1.5. Regarding the curriculum, performance standards and academic expectations are effectively translated into learning objectives and lesson plans that are clearly articulated to students.

1.6. The curriculum is aligned with state and national standards in applicable content areas.

1.7. Regarding the curriculum, coursework connects to life beyond the school (e.g., continuing education, job and life skills, informed citizenship).

Standard 2 (Classroom and School Evaluation/Student Assessment). The school/teachers utilize high quality classroom evaluation/student assessment strategies to monitor and modify instruction on an ongoing basis to meet student needs and maximize student growth.

2.1. Student assessments, program evaluation, and other analyses of student
outcomes guide curriculum reviews and the introduction of new content.

2.2. Assessments of student learning are aligned with state and national standards in applicable content areas.

2.3. Assessments of student learning at the classroom level are utilized for diagnostic feedback (formative assessment) to inform instruction on a continuing basis.

2.4. Results of student assessments are utilized regularly for evaluating academic performance to inform future school improvement efforts.

2.5. Statewide accountability testing data are disaggregated across student groups (gender, poverty, race, disability, ELL) to monitor the performance of all student subgroups.

**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.

3.1. Teachers’ instructional methods address all aspects of student potential by utilizing data from multiple assessment formats (objective, essay, oral, performance, dispositions).

3.2. Teachers’ instructional practices provide high quality feedback (specific, diagnostic, actionable) to students about their progress (strengths and weaknesses) toward learning standards.

3.3. Teachers vary their instructional strategies to meet the needs of students across diverse learner needs.

3.4. Teachers’ instructional methods **challenge all students** regardless of their
level of achievement: low, medium, or high.

3.5. Teachers’ instructional strategies and practices emerge from collaborative, school-wide planning focused on the needs of all students.

3.6. Teachers’ instructional strategies and practices focus on higher order thinking and problem solving.

3.7. Teachers’ instructional strategies and practices utilize current digital technology.

3.8. Instructional quality and classroom management, in tandem, are so effective that time-on-task approaches 90% and student academic engagement (time actively concentrating on the lesson and not off-task, drifting, or daydreaming) approaches 85%.

3.9. Teachers pace their instruction (including their homework practices) to ensure in-depth content coverage of applicable local, state, and national standards.

3.10. Teachers’ instructional strategies and practices reflect high-quality best practice.

**Learning Environment (Standards 4-6)**

**Standard 4 (School Learning Climate/Culture).** The school functions as an effective learning community, reflecting high standards and high expectations for achievement and other outcomes across all student groups.

**Standard 4.A. (Respectful, Orderly Environment that Prioritizes Learning).** The school reflects a safe, orderly environment in which students, faculty, and staff are respected as individuals and student learning outcomes are a collective priority.
4.A.1. The school is a safe and caring environment for students: bullying, fighting, abusive language, etc. are not tolerated.

4.A.2. The school provides an orderly environment that prioritizes learning.

4.A.3. The learning environment is such that student achievement is highly valued and celebrated publicly.

4.A.4. The learning environment is protected by strictly enforcing student discipline in classrooms (interruptions to teaching and learning are not allowed).

4.A.5. The school culture reflects a strong “we” feeling where individuals (both teachers and students) are respected.

**Standard 4.B. (Teacher Expectations and Beliefs about Student Learning).**

Teachers believe that all students can learn at effective levels, have high expectations across all student sub-groups, and hold students accountable for learning outcomes.

4.B.1. Teachers really believe (not just lip service) that all students can learn at high levels.

4.B.2. Beliefs that teachers are responsible and accountable for student outcomes are embedded within the school culture.

4.B.3. Teachers have high expectations for student learning and the school faculty (collectively and individually) enforces these expectations rigorously.

4.B.4. Teachers (collectively and individually) have and enforce a strong commitment to excellence in learning for all students across levels of ability and diversity of background.
4.B.5. Teachers (collectively and individually) have and enforce a strong commitment to *equity (fair treatment) in learning* for all students across levels of ability and diversity of background.

**Standard 5 (Student, Family, and Community Support).** The school/district works with families and community groups to involve them in the life of the school and remove barriers to learning in an effort to meet the intellectual, social, career, and developmental needs of students.

5.1. Families and community members are active partners with the school in creating educational programs and services for students.

5.2. Students and their families have access to school- and community-based supports designed to reduce/overcome barriers to student learning.

5.3. Students and their families have access to non-cognitive assistance (medical/socio-emotional/financial) from school/community agencies.

5.4. Students and their families have access to school/community academic services that support suplement classroom instruction.

**Standard 6 (Teacher Improvement).** The school identifies teacher growth needs based on an analysis of student achievement patterns, provides high-quality professional development opportunities for staff, and implements a performance evaluation system that improves teaching and learning.

**Standard 6.A. (Professional Development).** The school/district provides research-based, collaboratively-developed, results-driven professional development opportunities for teachers/staff in order to improve teaching and learning.

6.A.1. Professional development is based on a long-term plan for helping teachers
improve their instructional practices.


6.A.3. Professional development priorities are connected to school improvement planning.

6.A.4. Professional development is directly linked to analysis of data on student outcomes.


6.A.6. Professional development priorities are developed collaboratively by the principal and faculty.

**Standard 6.B. (Professional Growth and Evaluation).** The principal/leadership team provides an effective performance evaluation system that is focused on helping teachers improve the quality of their instruction in order to improve teaching and learning.

6.B.1. The formal teacher evaluation process provides me with useful (fair and accurate) feedback that reflects my strengths and weaknesses as a teacher.

6.B.2. The formal teacher evaluation process provides me with sufficient resources/necessary support to help me grow as a teacher.

6.B.3. My Professional Growth Plan (PGP) has specific goals designed to help me improve my teaching.

6.B.4. The formal teacher evaluation process provides me positive, meaningful feedback that is focused on improving my ability to help students learn.
6.B.5. In addition to (or as part of) the formal teacher evaluation process, I receive routine, meaningful feedback on my teaching performance from administrators (walk throughs, instructional rounds, etc.).

**Efficiency (Standards 7-9)**

**Standard 7 (Leadership).** The principal/leadership team provides constructive, effective guidance that is collaboratively developed and respectful of all stakeholders while holding all individuals and groups accountable for their part in the collective focus on teaching, learning, and school improvement.

7.1. The principal’s leadership style brings out the best in faculty and staff.

7.2. The principal is an instructional leader.

7.3. Leadership ensures that school improvement/school policy committees are focused on improving academic performance.

7.4. Leadership utilizes data-driven decision making to inform choices about instruction and learning.

7.5. The leadership team systematically monitors the implementation of the school improvement plan, holding all individuals accountable for carrying out the goals/objectives/strategies for which they are charged.

7.6. The principal solicits teachers’ professional judgments in decisions about teaching, learning, and school improvement.

7.7. The principal is adamant about protecting instructional time.

**Standard 8 (Organizational Structure and Resource Allocation Focused on School Improvement).** The school is organized to maximize the effective use of all available resources so that students and staff can achieve at high levels.
8.1. Decisions about the school’s available resources are guided by the goal of improving faculty/staff performance to maximize academic outcomes.

8.2. Budgeting decisions reflect the principles of equity and fairness for all student subgroups.

8.3. Financial decisions of the SBDM/school council and other school committees are made in compliance with the school’s identified priorities for maximizing student achievement.

8.4. The school’s planning/resource allocation process is focused on continuous improvement of student outcomes (both short- and long-term goals).

8.5. Decisions about the structure and alignment of primary components in the school improvement plan (e.g., vision, mission, beliefs, objectives, action strategies, timelines, and resources) are guided by goals for student learning.

8.6. School resources are allocated based on a comprehensive long-term cycle of continuing program implementation and program evaluation, with revisions focused around goals for student learning.

**Standard 9 (Strategic Planning).** Strategic planning for the school/district involves leadership, faculty, staff, and parents/community in the development of a comprehensive long-term framework that communicates clear purpose, direction, and action strategies focused on teaching and learning.

9.1. Strategic planning engages leadership, faculty, staff, and parents/community as collaborative partners.

9.2. The strategic planning process identifies a limited number of goals (focused on school improvement) that the entire school faculty agrees upon (avoiding
counterproductive efforts spread across too many and/or conflicting goals).

9.3. The strategic planning process identifies a limited number of goals (focused on school improvement) that the entire school faculty is committed to (avoiding counterproductive efforts spread across too many and/or conflicting goals).
APPENDIX C

Standards and Indicators Scholastic Review (SISR)

Preamble (Implied Consent) on Human Subjects Research

You have been selected to participate in an important research project that analyzes the impact of building-level leadership and instruction on student achievement. The research project will be conducted by Eric T. Keeling, Educational Leadership Doctoral Candidate at Western Kentucky University. This is a parallel study that has been conducted by Dr. Stephen K. Miller, Dr. Kyong Hee Chon, Dr. Gary W. Houchens, and Mr. Richard Hunt. The original research was funded by the RCAP grant (2013) at Western Kentucky University. This research expands the original study to the Career and Technical Education setting.

The purpose of this study is to develop and validate teacher perceptual scales that are equivalent to the nine standards of the Standards and Indicators for School Improvement (SISI). Teachers of participating school districts, Career Centers and KY TECH ATCs will respond to the SISR survey eliciting their sense of the norms, beliefs, and practices at their school on topics related to the nine standards of the SISI.

In this study, you will be asked to answer items as they relate to priority and implementation on a questionnaire. Directions are provided at the beginning of the survey. The entire session should take 30 to 45 minutes. You may decline to answer any questions that may make you feel uncomfortable.

There are no foreseeable risks in answering the questions on this survey. The possible benefits of this study are related to replacing the site visit for Program Assessment currently used to evaluate Career and Technical Education programs and
facilities. The SISR may be adopted as an evaluative instrument to measure the quality of instruction and leadership in CTE schools or programs as they relate to student achievement. There is no compensation for participation. Total confidentiality cannot be guaranteed. Your confidentiality will be protected to the extent permitted by law. If the results from this study are published, no participants’ personal information will be disclosed.

Taking part in this study is voluntary. You may choose not to participate at all. If you decide not to be in the study, you may stop at any time. If you decide not to be in the study or if you stop taking part at any time during the survey, you will not be punished or lose any benefits for which you may qualify.

If you have any concerns or complaints about the study or the study staff, you may contact: Principal Investigator, Eric T. Keeling, Doctoral Candidate, at (270) 746-7205.

Sincerely,

Eric T. Keeling, Principal Investigator

THE DATED APPROVAL ON THIS PREAMBLE (IMPLIED CONSENT) INDICATES THAT THIS PROJECT HAS BEEN REVIEWED AND APPROVED BY THE WESTERN KENTUCKY UNIVERSITY INSTITUTIONAL REVIEW BOARD.

Paul Mooney, Human Protections Administrator TELEPHONE: (270) 745-2129.

Continuing to this survey implies your consent. Please click next to continue and begin with the brief section on demographics.
D Demographics Please select the appropriate choice for the questions below.

D1 My school is a/an

☐ KY TECH Area Technology Center (1)
☐ Locally Controlled CareerCenter (2)
☐ Comprehensive High School CTE Program (3)
Q43 My Area Technology Center, Career Center, or High School is located in the following county or independent district (Scroll down for independent districts):

- Adair (94)
- Allen (95)
- Anderson (96)
- Ballard (97)
- Barren (99)
- Bath (1)
- Belfry (2)
- Bell (3)
- Boone (4)
- Bourbon (100)
- Boyd (101)
- Boyle (102)
- Bracken (103)
- Breathitt (5)
- Breckinridge (6)
- Bullitt (7)
- Butler (52)
- Caldwell (104)
- Calloway (105)
- Campbell (8)
- Carlisle (106)
- Caldwell (9)
- Carroll (10)
- Carter (107)
- Casey (11)
- Christian (108)
- C.E.McCormick (53)
- Clark (12)
- Clay (13)
- Clinton (14)
- Crittenden (109)
- Corbin (15)
- Cumberland (110)
- Daviess (111)
- Edmonson (112)
- Elliott (113)
Estill (114)
Fayette (115)
Fleming (116)
Floyd (16)
Franklin (117)
Fulton (17)
Gallatin (118)
Garrard (18)
Grant (119)
Graves (120)
Grayson (121)
Green (19)
Greenup (20)
Harrison (21)
Hart (122)
Henderson (123)
Henry (124)
Hickman (125)
Hopkins (126)
Hughes Jones-Harrodsburg (22)
Jackson (23)
Jefferson (128)
Jessamine (129)
Johnson (130)
Kenton (131)
Knott (24)
Knox (25)
Larue (132)
Lake Cumberland (26)
Lee (27)
Leslie (28)
Letcher (29)
Lewis (133)
Lincoln (30)
Livingston (134)
Logan (135)
Lyon (136)
McCracken (137)
McCReary (138)
- McLean (139)
- Madison (140)
- Magoffin (141)
- Marion (31)
- Marshall (142)
- Martin (32)
- Mason (33)
- Mayfield/Graves (34)
- Meade (35)
- Meniffee (143)
- Mercer (144)
- Metcalfe (145)
- Millard (36)
- Monroe (37)
- Montgomery (38)
- Morgan (39)
- Muhlenberg (146)
- Murray/Calloway (40)
- Nelson (41)
- Nicholas (147)
- Ohio (42)
- Oldham (148)
- Owen (149)
- Owsley (150)
- Pendelton (151)
- Perry (152)
- Pike (153)
- Powell (154)
- Paducah (43)
- Pulaski (44)
- Robertson (155)
- Rockcastle (45)
- Rowan (156)
- Russell (46)
- Russellville (47)
- Scott (158)
- Shelby (48)
- Simpson (159)
- Spencer (160)
Taylor (161)
Todd (162)
Trigg (163)
Trimble (164)
Union (165)
Warren (49)
Washington (167)
Wayne (168)
Wayne (50)
Webster (51)
Whitley (170)
Wolfe (171)
Woodford (172)
Anchorage Independent (173)
Ashland Independent (174)
Augusta Independent (175)
Barbourville Independent (176)
Bardstown (177)
Beechwood Ind. (178)
Bellevue Ind. (179)
Berea Ind. (180)
Bowling Green Ind. (181)
Burgin Ind. (182)
Campbellsville Ind. (183)
Caverna Ind. (184)
Cloverport Ind. (185)
Corbin Ind. (186)
Covington Ind. (187)
Danville Ind. (188)
Dawson Springs Ind. (189)
Dayton Ind. (190)
East Bernstadt Ind. (191)
Elizabethtown Ind. (192)
Eminence Ind. (193)
Erlanger-Elsmere Ind. (194)
Fairview Ind. (195)
Ft. Thomas Ind. (196)
Frankfort Ind. (197)
Fulton Ind. (198)
Glasgow Ind. (199)
Harlan Ind. (200)
Hazard Ind. (201)
Jackson Ind. (202)
Jenkins Ind. (203)
Ludlow Ind. (204)
Mayfield Ind. (205)
Middlesboro Ind. (206)
Murray Ind. (207)
Newport Ind. (208)
Owensboro Ind. (209)
Paducah Ind. (210)
Paintsville Ind. (211)
Paris Ind. (212)
Pikeville Ind. (213)
Pineville Ind. (214)
Raceland-Worthington Ind. (215)
Russell Ind. (216)
Russellville Ind. (217)
Science Hill Ind. (218)
Silver Grove Ind. (219)
Somerset Ind. (220)
Southgate Ind. (221)
Walton-Verona Ind. (222)
West Point Ind. (223)
Williamsburg Ind. (224)
Williamstown Ind. (225)

D2 My gender is

Female (1)
Male (2)
D4 My highest degree earned is

- Less than A.S. Degree (1)
- A.S. Degree (2)
- Bachelor's Degree (3)
- Master's Degree (4)
- Specialist (5)
- Doctorate (6)
D7 For locally controlled Career Center school teachers, my career cluster/content area is (Please select the option that most closely fits your situation)

- Agriculture, Food, & Natural Resources (1)
- Arts, A/V Technology & Communications (2)
- Architecture & Construction (15)
- Business Management & Administration (16)
- Education & Training (17)
- Finance (18)
- Government & Public Administration (19)
- Health Sciences (20)
- Hospitality & Tourism (21)
- Human Services (22)
- Information Technology (23)
- Law, Public Safety, Corrections, & Security (24)
- Manufacturing (25)
- Marketing (26)
- Science, Technology, Engineering, & Mathematics (27)
- Transportation, Distribution, & Logistics (28)
- Not Applicable (29)

Q41 Position

- K-12 Principal (1)
- CTE Principal (2)
- CTE Teacher (3)

If K-12 Principal Is Selected, Then Skip To “I have been employed as an educator for”
If CTE Principal Is Selected, Then Skip To “I have been employed as an educator for”
If K-12 Principal Is Selected, Then Skip To “I have been employed as an educator for”
D8 I have been employed as a principal for

- First year (1)
- 3 years (2)
- 4 years (3)
- 5 years (4)
- 6 years (5)
- 7 years (6)
- 8 years (7)
- 9 years (8)
- 10 years (9)
- 11 years (10)
- 12 years (11)
- 13 years (12)
- 14 years (13)
- 15 years (14)
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- 19 years (18)
- 20 years (19)
- 21 years (20)
- 22 years (21)
- 23 years (22)
- 24 years (23)
- 25 years (24)
- 26 years (25)
- 27 years (26)
- 28 years (27)
- 29 years (28)
- 30 + year (29)
- Not applicable (30)
Q45 Prior to my role as principal, I was a teacher for

- 1 yr (1)
- 2 yrs (2)
- 3 yrs (3)
- 4 yrs (4)
- 5 yrs (5)
- 6 yrs (6)
- 7 yrs (7)
- 8 yrs (8)
- 9 yrs (9)
- 10 yrs (10)
- 11 yrs (11)
- 12 yrs (12)
- 13 yrs (13)
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- 18 yrs (18)
- 19 yrs (19)
- 20 yrs (20)
- 21 yrs (21)
- 22 yrs (22)
- 23 yrs (23)
- 24 yrs (24)
- 25 yrs (25)
- 26 yrs (26)
- 27 yrs (27)
- 28 yrs (28)
- 29 yrs (29)
- 30 yrs (30)
- Not Applicable (31)
Q44 I have been employed as a teacher for (include all teaching assignments in all buildings)

- 1 year (1)
- 2 years (2)
- 3 years (3)
- 4 years (4)
- 5 years (5)
- 6 years (6)
- 7 years (7)
- 8 years (8)
- 9 years (9)
- 10 years (10)
- 11 years (11)
- 12 years (12)
- 13 years (13)
- 14 years (14)
- 15 years (15)
- 16 years (16)
- 17 years (23)
- 18 years (24)
- 19 years (25)
- 20 years (26)
- 21 years (27)
- 22 years (28)
- 23 years (29)
- 24 years (30)
- 25 years (32)
- 26 years (33)
- 27 years (34)
- 28 years (35)
- 29 years (36)
- 30 years (37)
- 31 or more (38)
D9 I have been employed in the school in which I am currently working for

- First year (1)
- 2 years (2)
- 3 years (3)
- 4 years (4)
- 5 years (5)
- 6 years (6)
- 7 years (7)
- 8 years (8)
- 9 years (9)
- 10 years (10)
- 11 years (11)
- 12 years (12)
- 13 years (13)
- 14 years (14)
- 15 years (15)
- 16 years (16)
- 17 years (17)
- 18 years (18)
- 19 years (19)
- 20 years (20)
- 21 years (21)
- 22 years (22)
- 23 years (23)
- 24 years (24)
- 25 years (25)
- 26 years (26)
- 27 years (27)
- 28 years (28)
- 29 years (29)
- 30 + years (30)
D10 Did you participate in the NTI / MOI teacher preparation program?

- Yes (1)
- No (2)

QII Please continue to the SISR (Part 1)
Q1 Academic Performance (Standards 1-3)

You will rate each question on two dimensions. Please mark each item as an informant: your sense of the norms, beliefs, and practices throughout your school.

Implementation = Pervasiveness (both how widespread and how frequent) throughout the school

Effectiveness = Quality/impact for producing student outcomes

For both Implementation and Effectiveness:

Very Low = 1; Low = 2; Medium = 3; High = 4; Very High = 5

<table>
<thead>
<tr>
<th>Implementation</th>
<th>Effectiveness</th>
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<td>Very Low (1)</td>
<td>Very Low (1)</td>
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<td>High (4)</td>
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<td>Very High (5)</td>
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1. The curriculum (elementary, middle, or high) prepares students for success in Advanced Placement (AP) and college level courses. (1)

2. The curriculum provides rigorous exposure to advanced math and science content. (2)

3. Curriculum standards are systematically monitored for vertical alignment across grade levels and school transitions. (3)
4. The curriculum provides equal access to rigorous standards and learning expectations for students from all groups/backgrounds. (4)

5. The school's curriculum is regularly reviewed for needed adjustments, taking account of new content, feedback from student/program evaluation, disaggregation of data across student groups, etc. (5)

6. Curriculum performance standards and academic expectations are effectively translated into learning objectives and lesson plans that are clearly articulated to students. (6)

7. The curriculum is fully aligned with state and national Common Core Standards (KCAS in Kentucky) in all applicable content areas. (7)

8. The curriculum at my school effectively connects
coursework to life beyond the school (e.g., continuing education, job and life skills, informed citizenship). (8)

9. Classroom assessments of student learning are frequent, rigorous, and aligned with state and national Common Core Standards in applicable content areas. (9)

10. Classroom assessments of student learning are utilized as diagnostic feedback (formative assessment) that informs instruction on an ongoing basis. (10)

11. School and classroom assessments of student learning are utilized regularly to evaluate academic performance to inform future school improvement efforts. (11)

12. Statewide accountability testing data are disaggregated across student groups (gender, poverty, race, disability, ELL) to
13. Classroom assessments are collected in multiple formats (objective, essay, oral, performance, dispositions) to ensure that all aspects of student potential are addressed. (13)

14. Classroom assessments provide high quality feedback (specific, diagnostic, actionable) to students about their progress (strengths and weaknesses) toward learning standards. (14)

15. Evaluation of student work is planned/developed collaboratively by teachers and administrators. (15)

16. Effective, high quality, rigorous assessment practices are utilized to evaluate student work. (16)

17. Instructional strategies are aligned with applicable state and national Common
<table>
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<th>Core Standards (and expectations) for student learning.  (17)</th>
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<tr>
<td>18. Instructional strategies are varied to meet the needs of students across diverse learner needs. (18)</td>
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<td>19. Classroom instruction reflects teachers’ knowledge and utilization of high-level content mastery that challenges all students. (19)</td>
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<td>20. Classroom instruction reflects collaborative, school-wide teacher planning focused on the needs of all students. (20)</td>
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<td>21. Instructional strategies focus on higher order thinking and problem solving. (21)</td>
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<td>22. Classroom instruction utilizes Web access and current technology. (22)</td>
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<td>23. Instructional pacing (including homework policies) ensures content coverage and in-depth treatment of all applicable state</td>
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and national Common Core Standards. (23)

24. Teachers’ instructional strategies reflect high-quality best practice. (24)

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T1  Great job! Keep going!
Q2 Learning Environment (Standards 4-6)

You will rate each question on two dimensions. Please mark each item as an informant: your sense of the norms, beliefs, and practices throughout your school. Implementation = Pervasiveness (both how widespread and how frequent) throughout the school.

Effectiveness = Quality/impact for producing student outcomes

For both Implementation and Effectiveness:

Very Low = 1; Low = 2; Medium = 3; High = 4; Very High = 5

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<td>students: bullying,</td>
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<td>language, etc. are</td>
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<td>not tolerated.</td>
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<td>26. The school</td>
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<td>provides an orderly</td>
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<td>prioritizes learning.</td>
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<td>27. The learning</td>
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<td>achievement is</td>
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<td>highly valued and</td>
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<td>celebrated publicly.</td>
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<td>28. Student discipline in classrooms is</td>
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<td>strictly enforced so that the teaching and learning environment is not interrupted. (4)</td>
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<td>Teachers really believe (not just lip service) that all students can learn at high levels. (5)</td>
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<td>Beliefs that teachers are responsible and accountable for student outcomes are embedded within the school culture. (6)</td>
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<td>Teachers hold and enforce high expectations for student learning. (7)</td>
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<td>The school culture reflects a strong “we” feeling where individuals (both teachers and students) are respected. (8)</td>
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<td>The learning environment reflects a strong commitment to excellence in learning for all students across levels of ability and diversity of background. (9)</td>
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<td>The learning environment reflects a strong commitment to</td>
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<td>equity (fair treatment) in learning for all students across levels of ability and diversity of background. (10)</td>
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<td>35.</td>
<td>Families and community members are active partners in the educational process in creating programs and services for students. (11)</td>
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<td>36.</td>
<td>Students and their families have access to school- and community-based supports designed to reduce/overcome barriers to student learning. (12)</td>
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<td>37.</td>
<td>Students and their families have access to non-cognitive assistance (medical/socio-emotional/financial) from school/community agencies. (13)</td>
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<td>38.</td>
<td>Students and their families have access to school/community academic services that support/supplement classroom instruction. (14)</td>
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<td>39.</td>
<td>Professional</td>
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development is based on a long-term plan for helping teachers improve their instructional practices. (15)

40. Professional development priorities reflect teachers’ professional growth plans. (16)

41. Professional development priorities are connected to school improvement planning. (17)

42. Professional development is directly linked to analysis of data on student outcomes. (18)

43. Professional development content reflects best practice (knowledge, skills, dispositions) for teachers’ instructional strategies. (19)

44. Professional development priorities are developed collaboratively by the principal and faculty. (20)

T2  Your school data are important! Keep focused!
Q3 Learning Environment (Standards 4-6)

Note: for items 45 – 49 below, report for each item based on your own perceptions and experience, not your sense of norms for the entire school.

Implementation = Pervasiveness (both how widespread and how frequent) throughout the school

Effectiveness = Quality/impact for producing student outcomes

For both Implementation and Effectiveness:

Very Low = 1; Low = 2; Medium = 3; High = 4; Very High = 5

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<tr>
<td>45. The formal teacher evaluation process provides me with useful (fair and accurate) feedback that reflects my strengths and weaknesses as a teacher. (1)</td>
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<td>Very High 5 (5)</td>
<td>Very High 5 (5)</td>
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<tr>
<td>46. The formal teacher evaluation process provides me with sufficient resources/necessary support to help me grow as a teacher. (2)</td>
<td>Very Low 1 (1)</td>
<td>Very Low 1 (1)</td>
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<td>Very High 5 (5)</td>
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<tr>
<td>47. My Professional Growth Plan (PGP) has specific goals designed to help</td>
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<td>Low 2 (2)</td>
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<td>Very High 5 (5)</td>
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me improve my teaching. (3)

48. The formal teacher evaluation process provides me positive, meaningful feedback that is focused on improving my ability to help students learn. (4)

49. In addition to (or as part of) the formal teacher evaluation process, I receive routine, meaningful feedback on my teaching performance from administrators (walk throughs, instructional rounds, etc.). (5)

T3    Excellent! You're almost half way through.
Q4  Efficiency (Standards 7-9)

You will rate each question on two dimensions. Please mark each item as an informant: your sense of the norms, beliefs, and practices throughout your school.

Implementation = Pervasiveness (both how widespread and how frequent) throughout the school

Effectiveness = Quality/impact for producing student outcomes

For both Implementation and Effectiveness:

Very Low = 1; Low = 2; Medium = 3; High = 4; Very High = 5

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<tr>
<th></th>
<th>Implementation</th>
<th>Effectiveness</th>
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<td>Very Low 1 (1)</td>
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<td>50. The principal's leadership style brings out the best in faculty and staff. (1)</td>
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<td>51. The principal is an instructional leader. (2)</td>
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<td>52. Leadership ensures that school improvement/school policy committees are focused on improving academic performance. (3)</td>
<td>●</td>
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<td>53. Leadership’s decisions about instruction and learning are data-driven. (4)</td>
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<td>54. The leadership team systematically monitors the implementation of the school improvement</td>
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</table>
| plan, holding all individuals accountable for carrying out the goals/objectives/strategies for which they are charged. (5)  
55. The principal involves faculty and staff in collaborative planning for school improvement. (6)  
56. The principal solicits teachers’ professional judgments in decisions about teaching and learning. (7)  
57. The principal is adamant about protecting instructional time. (8)  
58. The school’s structure and available resources are organized to maximize/enhance academic outcomes and staff performance. (9)  
59. Allocation of faculty (how teachers are assigned) is based on data-driven needs assessment. (10)  
60. Budgeting decisions reflect the principles of equity and fairness for all student subgroups. (11)  
61. Financial decisions of the SBDM/school council and other school committees are made in compliance with the school’s identified priorities for
maximizing student achievement. (12)

62. The school’s strategic planning process is clearly focused on continuous improvement (both short- and long-term goals) for student outcomes. (13)

63. The school’s strategic plan aligns primary components (e.g., vision, mission, beliefs, objectives, action strategies, timelines, and resources) around goals for student learning. (14)

64. The school’s strategic plan reflects a comprehensive long-term cycle of continuing program implementation and program evaluation, with revisions consistent with each new round of evaluation results. (15)

65. The strategic planning process utilizes a state-of-the-art data management system that integrates on-going data analysis, collected from multiple sources. (16)

66. Strategic planning engages leadership, faculty, staff, and parents/community as collaborative partners.
67. The strategic planning process identifies a limited number of goals (focused on school improvement) that the entire school faculty agree upon (avoiding counterproductive efforts spread across too many and/or conflicting goals). (18)

68. The strategic planning process identifies a limited number of goals (focused on school improvement) that the entire school faculty are committed to (avoiding counterproductive efforts spread across too many and/or conflicting goals). (19)

T4  You’ve finished Part 1! Now on to the much shorter Part 2!
Q12 Directions for the SISR (Part 2)

In this section, you are prioritizing your school’s utilization of each of the nine standards. This part requires each faculty member (including all full-time certified staff in the school) to mark his/her responses on the dimension that measures the relative emphasis from one standard to the next: Action Priorities. Each standard is rated for both short and long term priorities.

As you fill out the survey, you will take an Informant perspective, i.e., for each item, what is your sense of the overall school norms for Action Priorities (the actual attention/emphasis given to each standard throughout your school).

The 5-point response scale for Part 2 is listed below. When you mark the items on the Qualtrics online survey, you will fill in the circle that corresponds to the five levels of response for Action Priorities.
Q5 Standards and Indicators Scholastic Review: Prioritizing the Standards

The Nine Standards

Please rate each standard as an informant: your sense of the overall building Action Priorities throughout your school.

Action Priorities = Attention/emphasis given throughout the school

For Action Priorities:

Very Low = 1; Low = 2; Medium = 3; High = 4; Very High = 5

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

<table>
<thead>
<tr>
<th>Action Priorities</th>
<th>Very Low 1 (1)</th>
<th>Low 2 (2)</th>
<th>Medium 3 (3)</th>
<th>High 4 (4)</th>
<th>Very High 5 (5)</th>
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<tbody>
<tr>
<td>1.a. Short term: The school is focused on implementing this standard correctly right now – in the daily and weekly rhythms of practice. (1)</td>
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<td>1.b. Long term: The school is focused on doing what needs to be done to</td>
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<td>ensure continuous improvement in this standard for the long term. (2)</td>
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</table>
Q6 Standard 2 (Classroom Evaluation/Student Assessment): The school/teachers utilize high quality classroom evaluation/student assessment strategies to monitor and modify instruction on an ongoing basis to meet student needs and maximize student growth.

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<th>Action Priorities</th>
<th>Very Low 1 (1)</th>
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<th>Medium 3 (3)</th>
<th>High 4 (4)</th>
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<td>2.a. Short term: The school is focused on implementing this standard correctly right now – in the daily and weekly rhythms of practice. (1)</td>
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<td>2.b. Long term: The school is focused on doing what needs to be done to ensure continuous improvement in this standard for the long term. (2)</td>
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</table>
Q7 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.

<table>
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<tr>
<th>Action Priorities</th>
<th>Very Low 1 (1)</th>
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<th>Medium 3 (3)</th>
<th>High 4 (4)</th>
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<td>3.a. Short term: The school is focused on implementing this standard correctly right now – in the daily and weekly rhythms of practice. (1)</td>
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<td>3.b. Long term: The school is focused on doing what needs to be done to ensure continuous improvement in this standard for the long term. (2)</td>
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Q8  Standard 4 (School Learning Climate/Culture): The school functions as an effective learning community, reflecting high standards and high expectations for achievement and other outcomes across all student groups.

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<td>4.a. Short term: The school is focused on implementing this standard correctly right now – in the daily and weekly rhythms of practice. (1)</td>
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<td>4.b. Long term: The school is focused on doing what needs to be done to ensure continuous improvement in this standard for the long term. (2)</td>
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Q9  Standard 5 (Student, Family, and Community Support): The school/district works with families and community groups to involve them in the life of the school and remove barriers to learning in an effort to meet the intellectual, social, career, and developmental needs of students.

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<th>Action Priorities</th>
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Standard 6 (Teacher Improvement): The school identifies teacher growth needs based on an analysis of student achievement patterns, provides high-quality professional development opportunities for staff, and implements a performance evaluation system that improves teaching and learning. Standard 6.1 (Professional Development): The school/district provides research-based, collaboratively-developed, results-driven professional development opportunities for teachers/staff in order to improve teaching and learning.

<table>
<thead>
<tr>
<th>Action Priorities</th>
<th>Very Low 1 (1)</th>
<th>Low 2 (2)</th>
<th>Medium 3 (3)</th>
<th>High 4 (4)</th>
<th>Very High 5 (5)</th>
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<td>6.1.a. Short term: The school is focused on implementing this standard correctly right now – in the daily and weekly rhythms of practice. (1)</td>
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<td>6.1.b. Long term: The school is focused on doing what needs to be done to ensure continuous improvement in this standard for the long term. (2)</td>
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</table>
Q11 Standard 6.2 (Professional Growth and Evaluation): The principal/leadership team provides an effective performance evaluation system that is focused on helping teachers improve the quality of their instruction in order to improve teaching and learning.

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<th>Action Priorities</th>
<th>Very Low 1 (1)</th>
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<td>6.2.a. Short term: The school is focused on implementing this standard correctly right now – in the daily and weekly rhythms of practice. (1)</td>
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Q12 Standard 7 (Leadership): The principal/leadership team provides constructive, effective guidance that is collaboratively developed and respectful of all stakeholders while holding all individuals and groups accountable for their part in the collective focus on teaching, learning, and school improvement.

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<th>Action Priorities</th>
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</table>
Q13 Standard 8 (Organizational Structure and Resource Allocation): The school is organized to maximize the effective use of all available resources so that students and staff can achieve at high levels.

<table>
<thead>
<tr>
<th>8.a. Short term: The school is focused on implementing this standard correctly right now – in the daily and weekly rhythms of practice. (1)</th>
<th>Very Low 1 (1)</th>
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<th>8.b. Long term: The school is focused on doing what needs to be done to ensure continuous improvement in this standard for the long term. (2)</th>
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Q14 Standard 9 (Planning for School Improvement): 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.

<table>
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<th>Action Priorities</th>
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<td>9.a. Short term: The school is focused on implementing this standard correctly right now – in the daily and weekly rhythms of practice.</td>
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<td>9.b. Long term: The school is focused on doing what needs to be done to ensure continuous improvement in this standard for the long term.</td>
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T6 THANK YOU! Please click next to submit.
APPENDIX D

IRB APPROVAL LETTER

DATE: December 12, 2014
TO: Eric Keeling, M.S.
FROM: Western Kentucky University (WKU) IRB
PROJECT TITLE: [685006-1] Career and Technical Education: The Impact of Leadership on Student Achievement
REFERENCE #: IRB 15-223
SUBMISSION TYPE: New Project
ACTION: APPROVED
APPROVAL DATE: December 12, 2014
EXPIRATION DATE: May 16, 2015
REVIEW TYPE: Expedited Review

Thank you for your submission of New Project materials for this project. The Western Kentucky University (WKU) IRB has APPROVED your submission. This approval is based on an appropriate risk/benefit ratio and a project design wherein the risks have been minimized. All research must be conducted in accordance with this approved submission.

This submission has received Expedited Review based on the applicable federal regulation.

Please remember that informed consent is a process beginning with a description of the project and insurance of participant understanding followed by an implied consent form. Informed consent must continue throughout the project via dialogue between the researcher and research participant. Federal regulations require each participant receive a copy of the consent document.

Please note that any revision to previously approved materials must be approved by this office prior to initiation. Please use the appropriate revision forms for this procedure.

All UNANTICIPATED PROBLEMS involving risks to subjects or others and SERIOUS and UNEXPECTED adverse events must be reported promptly to this office. Please use the appropriate reporting forms for this procedure. All FDA and sponsor reporting requirements should also be followed.

All NON-COMPLIANCE issues or COMPLAINTS regarding this project must be reported promptly to this office.

This project has been determined to be a Minimal Risk project. Based on the risks, this project requires continuing review by this committee on an annual basis. Please use the appropriate forms for this procedure. Year documentation for continuing review must be received with sufficient time for review and continued approval before the expiration date of May 15, 2015.

Please note that all research records must be retained for a minimum of three years after the completion of the project.

If you have any questions, please contact Paul Mowery at (270) 745-2129 or irb@wku.edu. Please include your project title and reference number in all correspondence with this committee.
INFORMED CONSENT DOCUMENT

Project Title: CAREER AND TECHNICAL EDUCATION: THE IMPACT OF LEADERSHIP ON STUDENT ACHIEVEMENT

Investigator: Eric T. Keeling, Educational Leadership Doctoral Program Western Kentucky University, Phone: (270) 745-2129

You are being asked to participate in a project conducted through Western Kentucky University. The University requires that you give your agreement to participate in this project.

The investigator will explain to you in detail the purpose of the project, the procedures to be used, and the potential benefits and possible risks of participation. You may ask any questions you have to help you understand the project. A basic explanation of the project is written below. Please read this explanation and discuss with the researcher any questions you may have. You should keep given a copy of this form for your records.

1. **Nature and Purpose of the Project:** The purpose of this study is to analyze the impact of a mediated model of leadership on student achievement, through its effect on instruction. The Standards and Indicators Scholastic Review will be the primary instrument to gather data.

2. **Explanation of Procedures:** You are requested to complete a survey on the topic. Please continue on with the indicator below.

3. **Discomfort and Risks:** This approach maintains minimal risk with little to no human contact. The survey is computer based, implying no side effects, risks to placebo, or risks of normal treatment delay.

4. **Benefits:** The SISR provides an evaluative instrument rather than the documentation of activities provided through the Program Assessment. If the SISR proves to be significant, the OCTE will be able to eliminate the cost of annual Program Assessment trainings, site visits, and the support staff to administer the program across the state. In addition, teachers will be able to use an evaluation tool to support their program improvement plan and the school improvement plan based on student achievement.

5. **Confidentiality:** Participants are not asked to provide personal identifiers, and any links to you will be kept in the strictest of confidence in any and all reporting of the data collected.

6. **Refusal/Withdrawal:** Refusal to participate in this study will have no affect on any future services you may be entitled to from the University. Anyone who agrees to participate in this study is free to withdraw from the study at any time with no penalty.

You understand also that it is not possible to identify all potential risks in an experimental procedure, and you believe that reasonable safeguards have been taken to minimize both the known and potential but unknown risks.

**Your continued cooperation with the following survey implies your consent.**

THE DATED APPROVAL ON THIS CONSENT FORM INDICATES THAT THIS PROJECT HAS BEEN REVIEWED AND APPROVED BY THE WESTERN KENTUCKY UNIVERSITY INSTITUTIONAL REVIEW BOARD.

Paul Mooney, Human Protections Administrator
TELEPHONE: (270) 745-2129

WKU IRB# 15-223
Approval - 12/12/2014
End Date - 5/15/2016
Expedited
Original - 12/12/2014

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APPENDIX E

Office of Career & Technical Education Permission (KY TECH)
Associate Commissioner, Dr. Dale Winkler

Eric T. Keeling
1216 Cooper Dearing Road • Alvaton, KY 42122

Permission To Conduct Survey

As Associate Commissioner of the Office of Career and Technical Education I (please check the blank):

_______grant permission

_______do not grant permission

for Eric T. Keeling, a student in the Educational Leadership Doctoral program at Western Kentucky University to conduct a survey of CTC principals and teachers in the local school districts and CTE principals and teachers in the KY TECH system. This research is a parallel study with Dr. Stephen Miller, Dr. Gary Houchens, Dr. Kyong Hee Chon, and Richard Hunt of Western Kentucky University’s ICAP grant team. The team developed the Standards and Indicators for Scholastic Review (SISR). This study utilizes the (SISR) survey to analyze the effects of building-level leadership on student achievement, as represented by Work Keys scores, KOSSA scores, and Industry Certification in the CTE setting. The study will investigate potential relationships among demographic factors specific to CTE schools, leadership, instruction, and CTE student outcomes.

Signed: _______________________________  Date: _________________________

Please list the name of a representative who can help with contacting teachers via email if needed: _______________________________________________
Superintendent Letter

Eric T. Keeling
1216 Cooper Dearing Road • Alvaton, KY 42122

November 19, 2014

Dear Superintendent:

I am the principal at the Warren County Technology Center in Bowling Green, KY. I am an Ed. D. candidate in the Educational Leadership Doctoral program at Western Kentucky University and I am conducting a research study that considers the impact of CTE principals on student achievement in the CTE setting.

This research is a parallel study of Dr. Stephen Miller, Dr. Gary Houchens, Dr. Kyong Hee Chon, and Mr. Richard Hunt of Western Kentucky University’s ICAP grant team. The team developed the Standards and Indicators for Scholastic Review (SISR) survey. The SISR is designed to replace the week-long scholastic audit that was formerly used for underperforming schools. Their findings from their pilot were exciting and suggest the SISR may be more effective than the scholastic audit. This study utilizes the (SISR) survey to analyze the effects of building-level leadership in the CTE setting on student achievement, as represented by Work Keys scores, KOSSA scores, and Industry Certification. The study will investigate potential relationships among demographic factors specific to CTE schools, leadership, instruction, and CTE student outcomes.

The SISR should be conducted during a faculty meeting and will take approximately 30 minutes to complete. This study is being conducted under the guidance of Dr. Ric Keaster at Western Kentucky University. If you have any questions or concerns about the research you may contact him at 270-745-3061 or email him at Ric.Keaster@wku.edu. I can be reached at 270-746-7205 or by email at Eric.Keeling148@topper.wku.edu.

This state-wide study will assist central office leaders in identifying growth areas for school improvement and student achievement. Thank you for considering our invitation to participate. Please complete the attached permission form.

Sincerely,

Eric T. Keeling
Ed.D. Candidate
Western Kentucky University
APPENDIX G

Email to Principals
From: Eric T. Keeling
Sent: Wednesday, December 10, 2014 8:00 A.M.
To: Principals
Subject: SISR Survey

Dear Administrator:

I am the principal at the Warren County Technology Center in Bowling Green, KY. I am an Ed. D. candidate in the Educational Leadership Doctoral program at Western Kentucky University and I am conducting a research study that considers the impact of CTE principals on student achievement in the CTE setting. This study incorporates three sectors, KY TECH ATCs, locally controlled career centers, and CTE teachers in the comprehensive high school setting in the GRREC region.

Your superintendent has provided permission to conduct a survey of teachers and administrators utilizing the SISR survey in your district. The SISR is voluntary and should be conducted during a faculty meeting to ensure optimal participation. The results of this study have the potential to impact the delivery of CTE in Kentucky’s public school system. After completion of the survey, you can select the option to be entered into a drawing to win a $50.00 gift card at Walmart.

This study utilizes the (SISR) survey to analyze the effects of building-level leadership in the CTE setting on student achievement, as represented by Work Keys scores, KOSSA scores, and Industry Certification. The study will investigate potential relationships among demographic factors specific to CTE programs, leadership, instruction, and CTE student outcomes. Teachers and administrators will be asked to rank the priority and implementation of the Standards and Indicators for School Improvement-Revised.

The SISR should be conducted during a faculty meeting and will take approximately 30 minutes to complete. This study is being conducted under the guidance of Dr. Ric Keaster at Western Kentucky University. If you have any questions or concerns about the research you may contact him at 270-745-3061 or email him at Ric.Keaster@wku.edu. I can be reached at 270-746-7205 or by email at Eric.Keeling148@topper.wku.edu.

Thank you for carving time out of your faculty meeting to include this critical piece of research in your school!

Sincerely,

Eric T. Keeling