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P-20 ALIGNMENT FOR SMALL TOWNS AND RURAL COMMUNITIES

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P-20 ALIGNMENT FOR SMALL TOWNS AND RURAL COMMUNITIES

by

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Abstract

The purpose of this mixed methods study was to determine if there is a difference between current workforce skill levels and employer expectations within the Paducah micropolitan area. College and career readiness and cohort graduation rate data were collected for school systems in Kentucky from 2013 to 2016. Using both the college and career readiness data and the cohort graduation data as the dependent variables, the independent-sample t-tests were performed to compare the college and career readiness rates and cohort graduation rates of the pK-12 public schools in the Paducah micropolitan area (N = 12) versus the remaining pK-12 public schools (N = 157; N = 156)) in Kentucky. Interviews with instructional supervisors (N = 8) and presidents or human resource directors (N = 4) of the largest employers were conducted to analyze workforce preparedness of pK-12 public school students and workforce skill level expectations of new employees in the Paducah micropolitan area. Results of the statistical analyses lacked significance, indicating high school graduates in the Paducah micropolitan area had similar skills when compared to the other graduates across the state of Kentucky. However, analysis of the interviews suggested that recently hired employees in the Paducah micropolitan area lacked essential workforce skills. The convergent mixed method design was used to obtain a complete understanding of the lack of essential workforce skills in the Paducah micropolitan area. Discussions relate the outcomes of the study to existing research of identifying and teaching the essential workforce skills for the global economy.

Keywords: 21st century skills, P-20, O*NET, college and career readiness, cohort graduation rate Kentucky

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CHAPTER I: INTRODUCTION

For almost two and a half centuries, the United States has taken extreme pride in the strength of America's economy (Rising above the gathering storm, 2007). The economy has been the driving force of the high standard of life that Americans' experience compared to the rest of the world. America's national security and hope for even greater opportunities for its citizens in the future are directly linked to the continued success of the United States economic stronghold (Rising above the gathering storm, 2007). However, "the post-Great Recession economy has divided the country along a fault line demarcated by college education" (Carnevale, Jayasundera, & Gulish, 2016, p. 1). The job market outlook for U.S. citizens has been robust since the low point of the Great Recession that began in 2007 and started showing signs of growth in 2010 when jobs finally began to be added back to the U.S. economy at a constant rate. From January 2010 to January 2016, the U.S. added over 11.6 million jobs and a staggering 11.5 million (ninety-nine percent of the jobs added), went to U.S. citizens with at least some college education (Carnevale, Jayasundera, & Gulish, 2016).

The outlook for the American workforce with only a high school diploma or less still looks bleak. Not only have these low-skilled employees only seen approximately one percent job growth since the economic recovery starting in 2010, but these workers also saw the largest loss of jobs in the United States during the Great Recession. From 2007 to 2010, the United States economy saw a loss of 7.2 million jobs, of which 5.6 million of these jobs were held by workers with a high school diploma or less (Carnevale, Jayasundera, & Gulish, 2016). With the U.S. job market trends since 2010, the question has become "how does America's education system from preschool to college graduation align to ensure the high demand of a highly skilled

and educated workforce is met to ensure America's economic success in the global economy going forward?"

On a phone interview with reporters in early June 2017, current United States Labor Secretary R. Alexander Acosta stated, "The U.S. faces a serious skills gap" (Scheiber, 2017, para. 12). Secretary Acosta reported that in June of 2017 there were over six million vacant jobs in America. This represents the most unfilled jobs the U.S. Department of Labor has recorded since the department started keeping track of this statistic in the early 2000s (Scheiber, 2017). One can hypothesize that America's recent politicians have tried to solve the large number of unfilled jobs in the United States with a macro solution – an approach that makes the most sense to the largest group of people (Fox Business News, 2017). However, research suggests that the problem of unfilled jobs across America is actually a micro problem that requires alignment from preschool to a postsecondary degree or certification, which leads to a career in each specific economic area across the United States (Perna & Armijo, 2014; Rippner, 2014, 2015).

Former U.S. Department of Education Secretary Arne Duncan stated, "People across the country need to work together to make reforms happen. That includes elected officials, community leaders, educators, parents and students themselves. We all need to build a better future for our children in this country" (U.S. Department of Education, 2009, para. 5). Using former Secretary Duncan's words as a guide, the author examined the local economic area and the Paducah micropolitan area, as defined by the U.S. Department of Labor. For this research study, the author believes that within the Paducah micropolitan area, there is a significant difference between current workforce skill levels and employers' expectations.

Significance of the Problem

As a nation in the 21st century, the United States faces a technological revolution that has altered the way the world's economy interacts (Schwab, 2015). The key to America's economic success within the global economy setting is developing a workforce that has the necessary skills to create products that are in demand across the world (Donner & Shockley, 2010; Levy & Murnane, 2004; Smink, 2007). Thus, the challenge that the American education system faces is to "recognize the inexorable changes in the job distribution and to prepare young people with the skills needed in the growing number of good jobs" (Levy & Murnane, 2004, p. 6).

America's educational system was not originally designed to place large numbers of high school graduates into college. America's educational model was designed during the Industrial Age and is not well suited for meeting today's global economy's workforce needs that the United States faces (Davidovich, 2011). The public education system was designed to "prepare students for a very structured work environment that didn't necessarily call for independent thinking or complex behavior" (Davidovich, 2011, p. 43). To meet America's workforce needs, employees are needed who have the ability to solve complex problems, apply their learning to situations not encountered, and to collaborate with others through technological advances that connect workers across the globe. Thus, there is an imperative economic urgency to transform the current American school system to meet the needs of the workforce in today's global economy (Davidovich, 2011). This increased sense of urgency to produce the workforce that U.S. employers need to compete in the global economy has changed the demand of the United States' public educational system. Now publicly supported preschool through high school (or pK-12) school systems are faced with the expectation to graduate each and every student college and career-ready to ensure a successful transition to college or a successful transition into America's

workforce. In addition, colleges are faced with the demand from employers to produce college graduates with the necessary skills to be successful within the knowledge economy. To further compound the workforce needs, the knowledge economy is evolving at a tremendous pace that has never been experienced before ("Preparing every citizen for the knowledge economy" 2012).

As America emerged from the 2007-2010 Great Recession, an innovative economic trend categorized as "innovative districts" by Katz and Wagner (2014) has created a unique potential for economic growth in cities and metropolitan areas across the United States and across the globe. Globally, innovative districts are found in Barcelona, Spain; Berlin, Germany; London, England; Medellin, Columbia; Montreal, Canada; Seoul, South Korea; Stockholm, Sweden; and Toronto, Canada. Across the United States, innovative districts have evolved in Atlanta, Georgia; Baltimore, Maryland; Buffalo, New York; Cambridge, Massachusetts; Cleveland, Ohio; Detroit, Michigan; Houston, Texas; Philadelphia, Pennsylvania; Pittsburgh, Pennsylvania; St. Louis, Missouri; and San Diego, California. In addition, innovative districts are developing in Boston, Massachusetts; Brooklyn, New York; Chicago, Illinois; Portland, Oregon; Providence, Rhode Island; San Francisco, California; and Seattle, Washington. Still other innovative districts are shaping in former industrial districts and science parks like the Research Triangle Park in Raleigh-Durham that have become underutilized since the 2007 Great Recession (Katz & Wagner, 2014).

Innovative districts are geographical areas where companies and major research institutions cluster together and connect entrepreneur start-up companies. This assembling of talent in geographical areas draws creative people together which leads to increased collaboration between the people within the companies that are relocating. The new trend of clustering talent and companies is a change from the previous isolated innovational practices that

were present in America and across the globe before the 2007 Great Recession. Katz and

Wagner (2014) theorized that this change represents a radical transformation from the traditional

model for economic growth that was present before the recession by altering the locations of

how information in terms of ideas and knowledge is transformed at a faster rate than in the

previous economy. The impact of the emerging innovative districts has the potential to create

productive, inclusive, and sustainable economic development (Katz & Wagner, 2014). Thus,

these districts produce a competitive advantage for businesses to operate within the area by

allowing them to compete in the competitive global market that has emerged by helping their

cities and metropolitan areas "move up the value chain of global competitiveness by growing the

firms, networks, and trade sectors that drive broad-based prosperity" (Katz & Wagner, 2014, pp.

1-2).

Across America, "innovation districts help address three of the main challenges of our

(current) time: sluggish growth, national austerely and local fiscal challenges, rising social

inequality, and extensive sprawl and continued environmental degradation" (Katz & Wagner,

2014, p. 2). These challenges are addressed because innovation districts create areas within

cities and metropolitan areas where there is a mixing of economic, physical, and networking

assets in the same proximity. Institutions and organizations that create, drive, or support an

innovative environment are the economic assets that are essential to these districts. Both public

and privately owned buildings, open spaces, and/or infrastructure of these areas provide the

needed physical assets to create zones that provide space and opportunities for connectivity,

collaboration, and innovation. Networking assets are the interaction and relationships between

individual people, firms, and institutions. Working together in harmony – economic, physical,

and networking assets create an ecosystem that encourages and supports innovation and

advances in commercialization that are needed to compete in the global economy (Katz, Vey, & Wagner, 2015).

The rise of innovation districts across the United States' metropolitan areas are altering the way Americans live and work. Innovation districts have "revalued proximity, density, and other attributes of cities" (Katz, Vey, & Wagner 2015, p. 1). The result of the rise of innovation districts in large cities is a draw for young and talented workers in the United States' workforce because these cities offer attractive amenities within urban areas that create vibrant places in which to work and live (Katz, Vey & Wagner, 2015). The population change of college graduates between the ages of 25 to 34 living within three miles of America's top 51 metropolitan areas has increased 37 percent since 2010 (Cortright, 2014). Thus, metropolitan areas which contain the majority of the U.S. innovation districts are attracting college graduates that have the skills that America's firms and companies need to fill the workforce void that the global economy has created (Katz & Wagner, 2014).

The recent migration of young talented college graduates to major cities has created economic, social, and demographic disruption for small towns and rural communities (Katz & Wagner, 2014). Three decades ago, however, the adverse effects of the emerging global economy were seen as upcoming massive changes for rural communities because major cities were seen as preferred sites for the products and services in the global economy, due to their ability to export products (Sassen, 1996). "The implantation of global processes and markets in major cities has meant that the new internationalized sector of the economy has expanded sharply and has imposed a new set of criteria for valuing or pricing various economic activities and outcomes. This development has had a devastating effect on the large sectors of the urban economy and has been felt unevenly in urban communities" (Sassen, 1996, p. 629). Thus, small

towns and rural communities have been exposed to the possibility of negative economic impacts from the emergence of the global economy for over two decades.

The emergence of the global economy has impacted U.S. cities and America's rural communities differently. Major U.S. cities have experienced an economy that has provided the opportunity for economic growth while rural communities have experienced additional obstacles from the transition of the economy. Regardless of the community setting in today's economy, "the real challenge is how each community marshals resources in a deliberate and customized way to capitalize on advantages and realize the promise of production, inclusive, and sustainable growth" (Katz & Wagner, 2014, p. 14).

In an effort to align educational systems and resources throughout states across America to produce a higher percentage of an adult workforce that obtains postsecondary education degrees, "several states have attempted to remedy this disjuncture through curricular alignment, accreditation of secondary schools by colleges, and experimentation with streamlined state governance structures" (Rippner, 2014, p.2) by creating P-20 councils (sometimes called K-16, P-16, or K-20 councils). The main focus of these P-20 councils has been connecting statewide stakeholders to discuss aligning the efforts of each state's educational sectors by discussing different statewide educational issues in an effort to produce more college graduates (Rippner, 2014).

Research of the impact of state P-20 councils provides mixed results. Some researchers call the P-20 councils, which became popular in the 1990s, one of the most promising innovations for meeting the workforce demands of the global economy (Chamberlin & Pucker, 2008) while others have found that the P-20 state councils show "little empirical data to know whether they are, in fact, effective and in what form" (Rippner, 2014, p. 2). In the analysis of

State P-20 Councils and Collaboration Between K-12 and Higher Education (2014), the

researcher Jennifer Rippner concluded "there are myriad opportunities for future research on K-

12 and higher education collaboration that could have a strong impact on college access and

success. The case for collaboration is strong, but *how* to do it remains a problem to be solved"

(p. 32). Even though the "how" remains a question across states in America because there is

such a variance across state P-20 councils (Rippner, 2014). The need for state and local

communities to supply a highly educated workforce to meet the demands of the global economy

is imperative for the economic future of communities, states, and ultimately America (U.S.

Department of Education, 2006; U.S. Department of Education, 2012a; U.S. Department of

Education, 2012b).

In his 2012 State of the Union Address, President Barack Obama outlined a blueprint for

the American economy that is directly linked to the improvement of the United States'

educational system in response to the workforce demands of the global economy (U.S.

Department of Education, 2012b). In his address, President Obama challenged policymakers,

public officials, and educators to ensure that America's education system guarantee that each and

every student graduate high school prepared for college and a successful career in the United

States' workforce (U.S. Department of Education, 2012b). To meet President Obama's goal of

the United States once again producing the highest proportion of college graduate compared to

other countries, the U.S. Department of Education projected that each state in the United States

would have to increase its percent of college graduates by fifty percent by 2020 (U.S.

Department of Education, 2011b).

In 2015, the state of Kentucky announced its statewide strategic plan called "Kentucky

Rising." Kentucky's strategic plan was focused on implementing a "cradle to career" focus for

its education system to improve the economy of the Commonwealth of Kentucky ("Kentucky

Rising Fact Sheet," 2015). The goal of the strategic plan was to create a workforce "that is

among the world's most highly skilled, globally aware, and globally competent" ("Kentucky

Rising Fact Sheet," 2015, para. 2). By engineering and aligning its educational systems to create

a global workforce, Kentucky will meet the workforce demands of industry in Kentucky that are

trading with other countries in the global economy and Kentucky will meet the workforce

requirements of foreign companies that are investing in Kentucky (Honeycutt Spears, 2014). In

December of 2014, Kentucky's then Commissioner of Education, Dr. Terry Holliday, stated that

Kentucky's businesses and industry "can't find the skilled workforce that they need" (Honeycutt

Spears, 2014, para. 5) to successfully compete in the global economy.

Communities within the Commonwealth of Kentucky are experiencing the same

struggles with producing the workforce that is demanded by the growth of the global economy.

"In recent years, Paducah and McCracken County (located in western Kentucky) have seen the

gaseous diffusion plant cease operations and population growth slow as many young people

move to bigger cities and fewer find opportunities to bring them back home" ("Forward

Paducah: economic development strategy for Paducah," 2016, p. 2). (For nearly two centuries,

Paducah, Kentucky served as the cultural and economic center of Western Kentucky ("Forward

Paducah: economic development strategy for Paducah," 2016).

Paducah has also experienced a decline in population in every decade since the 1960

census ("Population of Paducah," 2016). In the past two decades, Paducah has experienced a

decline in its population from 27,256 residents in 1990 to 24,864 residents in 2015 (U.S. Census

Bureau, 2016). Recently, the report *Recent Economic Performance of Regions Around Kentucky*

(2010), the authors Paul Coomes and Barry Kornstein stated that the Paducah area was

"continuing to lose people due to the lack of job growth" (p. 17), and the Paducah micropolitan area experienced the slowest economic growth of any metropolitan or micropolitan area in Kentucky. To ensure economic prosperity and population growth in the future, the micropolitan area of Paducah needs to align the area's educational system to meet the needs of the local business community's workforce needs. Meeting the workforce needs of the Paducah area is imperative for the future of the local community which is similar to the Commonwealth of Kentucky's needs that are outlined in the Kentucky Rising strategic plan and President's Obama's directive to increase the number of college graduates by fifty percent by 2020.

Purpose of the Study

The purpose of this study is to identify necessary actions by secondary schools in the Paducah micropolitan area to supply the workforce that the community's businesses need. The problem of producing a workforce with the required knowledge and skills for the global economy is evident nationwide, throughout the state of Kentucky, and locally in the Paducah micropolitan area. This study will identify a process to determine the gaps within the education continuum from secondary schools to postsecondary institutions and the gaps in skills sought by local business and industry versus the skill levels present in the current Paducah micropolitan workforce.

Hypothesis

Within the Paducah micropolitan area, there is a significant difference between current workforce skill levels and employer expectations.

Research Questions

This study was designed to determine the answers to the following research questions:

1) What actions should secondary schools in the Paducah micropolitan area take to supply the local workforce needs?

2) What are the performance indicators needed by high school graduates in the Paducah micropolitan area to successfully transition to college?

3) What are the essential skills needed to successfully transition into the Paducah micropolitan area's workforce?

4) Is there a statistically significant difference in the performance indicators needed for successful transition to college for the Paducah micropolitan area compared to the state of Kentucky?

5) What actions should pK-12 public schools implement to teach the essential skills needed by the Paducah micropolitan businesses?

Definitions

1) 21st Century skills – Competencies defined as the most important behavior skills that include problem solving, fluid intelligence, teamwork, achievement/innovation, and communication skills (Burrus, Jackson, Xi, & Steinberg, 2013).

2) College readiness – State set minimum college entrance assessment benchmarks that allow first time college students to transition into college credit bearing coursework instead of taking developmental, supplemental, or transitional coursework that do not lead toward college degree requirements ("College Readiness Indicators," 2016).

3) Communication skills – The ability to use oral expression or written expression in the workforce (Burrus et. al, 2013).

4) Fluid intelligence – The ability to use mathematical reasoning and information reasoning in the workforce (Burrus et. al, 2013).

5) Innovation – The ability to use originality or apply knowledge to an unseen situation to create an invention in the workforce (Burrus et. al, 2013).

6) Innovative districts – Geographical areas where companies and major research institutions cluster together and connect entrepreneur start-up companies (Katz & Wagner, 2014).

7) Micropolitan – A geographical area that closely resembles a metropolitan area, but has a smaller nucleus of 10,000 to 50,000 people ("2010 Standards for Delineating Metropolitan and Micropolitan Statistical Areas," 2016; "Definition: Metropolitan and Micropolitan Areas," 2016).

8) Performance indicators – Critical academic measurements of a pK-12 students' correlation to success later in life ("Achieve and the American Diploma Project," 2016).

9) Teamwork – The ability to cooperate with others or have a concern for others in the workforce (Burrus et. al, 2013).

10) P-20 – An education term that defines a pathway for employment that focus on building a workforce of students from the "cradle" as they begin school to a "career" when they complete their education within a state or an economic region ("Kentucky Rising Fact Sheet," 2015).

11) Problem solving – The ability to use decision making or judgement in solving complex problems within the workforce (Burrus et. al, 2013).

CHAPTER II: LITERATURE REVIEW

In 1983, the *Nation at Risk* report was issued by the National Commission of Excellence in Education and warned America of the forthcoming economic impact of not having a highly educated workforce to meet the needs of the changing economy. The current economy that has evolved across the globe was created by infusing technologies that were products of the Industrial Revolution. The evolution of the global economy has increased rapidly by the infusion of technologies that have in essence connected citizens across the globe. Thus, products and services for the production of goods have significantly impacted the American economy.

As a result of the rapid evolution of the global economy, the United States' workforce has seen a dramatic shift in the type of education needed by the workforce to work in the competitive global economy (Donner & Shockley, 2010; Wagner, 2008). To succeed in today's economy, workers have to be both creative and innovative (Schwab, 2015). An analysis of the United States' job market trends from the 2007 through 2010 Great Recession period versus the recession recovery period shows a significant change in the workforce training that is demanded in today's economy. By analyzing these two recent time periods, there is quantitative data that suggests there was a negative impact on the availability of jobs for the portion of the United States' workforce with a high school education or less; and there was a positive impact on the availability of jobs for the portion of the United States' workforce with some college education or a college degree. This analysis quantifies the necessity for postsecondary training of high school graduates before they enter the workforce (Carnevale, Jayasundera, & Gulish, 2016).

Future projections of the skill level and training for our nation's workforce that is needed for America to compete in the global economy support the need for the United States' educational system to produce a higher number of workers with advanced degrees (Goodman,

Sands, & Coley, 2015; Levy and Murnane, 2013; Lockard & Wolf, 2012). Unfortunately, the

2007 report *Tough Choices or Tough Times* concludes that most Americans do not possess the

higher educational skills to succeed in the current economy. As a result, the U.S. government

and state leaders have challenged the nation's education system to produce more workers with

higher skill levels ("The White House," 2011; U.S. Department of Education, 2012a; U.S.

Department of Education, 2012b).

 An economic trend that has gained momentum across the United States and the world is

the creation of innovation districts in large metropolitan areas (Katz & Wagner, 2014). These

innovation districts are comprised of anchor institutions and companies that cluster and draw

America's most talented workers to the metropolitan area. As a result, small towns and rural

cities have experienced a negative impact on their populations (Cortright, 2014).

 To meet the needs of the rapidly evolving economy, President George W. Bush signed

the *No Child Left Behind* (NCLB) legislation in 2001 that was designed to focus attention on all

students' academic skills attainment levels. Subsequently, the implementation of the NCLB

legislation was left up to each state, and the legislation did not achieve its goal ("NAEP Nations

Report Card – The NAEP Mathematics Achievement Levels by Grade," 2016; "NAEP Nations

Report Card – The NAEP Reading Achievement Levels by Grade," 2016). In 2008, the National

Governors Association led the development of the Common Core Academic Standards, a set of

internationally benchmarked standards, that provided K-12 educational standards with the goal

of the standards leading students to workforce readiness that were adopted in some form by

(Bidwell, 2014). Despite these national education improvement efforts, the 2016 report by the

National Center on Education and the Economy entitled *What Does It Really Mean to be College*

and Work Ready? warns that a large portion of America's current high school graduates entering

college cannot perform all of the typical first year college work.

To address the needs of America's workforce, state educational systems have moved to a

P-20 focus that establishes metrics to measure student achievement from preschool through

postsecondary attainment levels to ensure workforce readiness (Achieve, Inc., 2013). Within the

educational research on the P-20 pipeline to workforce readiness, two transitions in the

continuum are significant. Students need to be *either* college or career-ready upon graduation

from high school to ensure successful transitions into the next phase of their lives (Achieve, Inc.,

2013); and, students need to leave postsecondary institutions with the necessary competencies to

obtain employment and flourish in the current economy (Burrus, Jackson, Xi & Steinberg, 2013).

Thus, the challenge that America faces is to create a P-20 system of education that meets local

and state workforce needs that respond to the needs of the rapid evolving global economy

(World Bank, 2010).

Emergence of Global Economy

The twentieth century has been referred to as both the "American Century and the Human

Capital Century" (Goodman, Sands, & Coley, 2015, p. 19). To the contrary, in 1983 the

National Commission on Excellence in Education issued the *A Nation at Risk* report that

assessed the quality of education in the United States and warned of the pending economic

impact by stating "we can take justifiable pride in what our schools and colleges have

historically accomplished and contributed to the United States and the well-being of its people,

the educational foundations of our society are presently being eroded by a rising tide of

mediocrity that threatens our very future as a Nation and a people" (U.S. Department of

Education, 1983, para. 1). What seemed like an outlandish statement to the American people in

1983 seems prophetic when one examines the United States' educational system and its impact

on America's current economy (Goodman et. al, 2015). Today's global economy requires

educated workers, managers, entrepreneurs, and citizens that invents modern technology and

uses the modern technology to innovate (Golden & Katz, 2008). To ensure that the U.S. can

compete in the evolving global economy, policymakers, public officials and educators must

understand how the "knowledge economy" was born, how it has evolved, and ultimately the

workforce demands that the new global economy requires to ensure America remains the

economic power in the world.

In an analysis of the history of the United States economy, Klaus Schwab (2015)

theorizes that America's First Industrial Revolution saw the rise of mechanized production

powered by water and steam. Mass production that was powered through harnessing electricity

led to the onset of the Second Industrial Revolution in the U.S. The Third Industrial Revolution

was centered on the use of electronics and informational technology that allowed production to

become computerized. Since the beginning of the mid-twentieth century, the Fourth Industrial

Revolution has built upon the automated production from the Third Industrial Revolution by

fusing together technologies that were products from the previous Industrial Revolution

(Schwab, 2015). This new revolution is evolving at a rapid pace by infusing technologies that

are connecting all parts of the globe creating global relationships that have, in effect, shrunk the

world (Mabogunje, 2002). As a result, the present global economy is fundamentally altering the

way people across the globe interact in their work environments and their social lives (Schwab,

2015).

Klaus Schwab (2015) theorizes that the current emergence of the global economy

"represents not merely a prolongation of the Third Industrial Revolution but rather the arrival of

the Fourth and distinctive one" in "velocity, scope, and systems impact" (p. 1), which is evolving

at a rate that the world has not seen nor experienced. The current industrial revolution was

created by computers that have changed the job market, as well as the human skills in demand.

"Computers usually substitute for people in performing specific tasks – not whole jobs. But

substituting for people in tasks still means fewer jobs than would otherwise be the case" (Levy &

Murnane, 2013, p. 13). This onset of the new industrial revolution has the potential to raise

income levels for people, businesses, and countries, if the workforce can compete in a global

economy (Schwab, 2015); yet the current industrial revolution also has the potential to produce

greater economic inequalities than the three previous industrial revolutions.

Therefore, workers in the global economy have seen a shift in the skills needed to ensure

that they gain viable employment in the global economy (Donner & Shockley, 2010; Wagner,

2008). Workers in the higher-tiered jobs in America's workforce no longer require "proficiency

in technical knowledge or procedural knowledge" (Donner & Shockley, 2010, p. 48). For

middle-class jobs, workers need more than a college education. Middle-class jobs now require

higher order cognitive skills that include the ability to reason abstractly, problem-solve,

communicate with others using various avenues, and collaborative skills (Levy & Murnane,

2014). In addition, higher-tier employment positions in the workforce in today's economy

require social skills, problem solving skills, creative thinking, integration of technology, and

leadership skills (Donner & Shockley, 2010).

To compete in the global economy, the United States' economic vitality will be directly

related to its ability to produce a highly educated, well-trained workforce that is both creative

and innovative (Donner & Shockley, 2010; Wagner, 2008). This shift in workforce needs is a

result of the dramatic shift in how the emergence of the global economy has impacted industry.

Prior to the infusion of technology in industry, corporations were comprised of top down hierarchies where employees within the corporation specialize in their functions (Wagner, 2008). However, the global connectedness that the business world has experienced allows for networks of cross-functional teams across the globe to work in collaboration on business projects (Wagner, 2008). Tony Wagner theorized that "the biggest challenge for our employees is having the critical-thinking and problem solving skills they need to be effective in their teams – because nobody is there telling them exactly what to do. They have to figure it out" (p. 15).

Global Economy's Impact on the United States' Workforce. The impact of the emergence of the knowledge economy has impacted the United States' workforce needs. In the mid-1950s, more than half of the jobs in America were either "blue-collar" or clerical jobs (Levy & Murnane, 2004). These jobs required little to no college education but provided a person with a comfortable lifestyle; however, few employees gained wealth in these job categories (Donner & Shockley, 2010). With the onset of the Fourth Industrial Revolution less than 40% of the workforce works in blue-collar jobs. With the transition to a global economy, the blue-collar jobs now require higher educational attainment levels than were required in the mid-twentieth century (Levy & Murnane, 2004).

The new global economy has also impacted the highly-skilled job sector. Information technology has been infused into the working sector and has impacted how simple tasks are performed in the workplace. Computers process information more effectively than human workers. The processing power of computers has caused high-tier employment opportunities for white-collar workers to diminish because businesses are not dependent upon a workforce that has procedural or technical knowledge (Donner & Shockley, 2010). Thus, computer processing has negatively impacted the demand for the white-collar job market.

With the onset of the global economy, a talented workforce with the ability to be creative and innovative will be the critical factor in the success of companies in the global economy (Schwab, 2015). Traditional middle-class jobs that previously required a college education transformed to jobs that in addition to a college education also require employees to have the ability to: solve problems, be creative, use abstract reasoning, have high order communication skills, and collaborate with a diverse group of people (Levy & Murnane, 2004; Wagner, 2008). Frank Levy and Richard Murnane (2013) theorized "that skills beget skills" (p. 22) in the current economy because the economy now demands college graduates that not only have learned strong foundational skills in college but also have to have the ability to acquire new job skills while on the job to increase workforce efficiency to meet the competition demands of the global economy.

Analysis of United States' Job Market from 2007 to 2016. In 2010, the United States' economy started to emerge from the 2007 recession. In analysis of America's job market since the 2007 recession, Anthony Carnevale, Tamara Jayasundera, and Artem Gulish (2016) found a vast difference in the United States' job market for those who have at least some college education versus the job market needs for those who have a high school diploma or less. Georgetown University Center on Education and the Workforce analysis of Current Population Survey data from 2007-2016 illustrates that the economic recovery from the 2007 recession created a workforce demand of workers with a bachelor's degree or higher.

Table 1

The United States' Change in Education Employment for Educational Attainment:

	Change in Employment		
Educational Attainment	Recession	Recovery	Net Change
High school or less	-5,611,000	80,000	-5,531,000
Some College/Associate's degree	-1,752,000	3,089,000	1,337,000
Bachelor's degree or higher	187,000	8,424,000	8,611,000
Bachelor's degree	-66,000	4,565,000	4,590,000
Master's degree or higher	253,000	3,768,000	4,021,000
All	-7,176,000	11,593,000	4,477,000

Note. Georgetown University Center on Education and the Workforce, (America's divided recovery: College haves and have-nots. Georgetown University Center on Education and the Workforce, p. 9). Recession = December 2007 to January 2010; Recovery = January 2010 to January 2016; Net Change = December 2007 to January 2016. Columns may not sum due to rounding.

From 2010 to 2016, America's job market added 11.6 million jobs. Of those 11.6 million added jobs, workers with at least some college education were employed in over 11.5 million of the total jobs which represented over ninety-nine percent of the new jobs that were created in that time period (Carnevale et. al, 2016, p. 1). As shown in the Table 1, workers with a high school diploma or less lost over 5.6 million jobs in the 2007 recession. In comparison, workers with some college education or an associate's degree lost over 1.7 million jobs in the recession while those workers with a bachelor's degree or higher lost only 187,000 jobs. In the recovery period (2010 to 2016) from the 2007 recession, the United States saw over 11.5 million jobs added. Table 1 illustrates a net change of almost 4.5 million jobs from the beginning of the 2007 recession to January of 2016. The job market for employees with a high school diploma or less

experienced a decrease in the number of jobs needed by over 5.5 million jobs. In contrast, the

job market demand for employees with some college education or associate's degree saw an

increase of over 1.3 million jobs, and the job market demand for employees with a bachelor's

degree or higher saw over 8.6 million jobs added. Those employees with at least some college

education gained employment in ninety-nine percent of the jobs added from 2010 to 2016

compared to only to a one percent job market employment rate for those with a high school

education or less (Carnevale et. al, 2016, p. 4). Thus, almost all jobs that have been added in the

United States since 2010 have gone to workers who have at least some college education. This

trend of needing some college education or a college degree to obtain employment in the global

economy is predicated on the fact that the global economy requires innovation minded workers

who can think and integrate new technologies into the workplace as they emerge (Uhalde &

Strohl, 2006).

Impact of 2007 Recession. Further analysis of the economic recovery of the recession

shows that the majority of the higher paying jobs as defined as paying $53,000 per year with full

benefits have gone to employees with some college education (Carnevale et. al, 2016). At the

same time, middle-wage jobs have disappeared from the American economy, and the majority of

those employees who were in middle-wage jobs prior to the recession have transitioned to low-

wage jobs or 'bad' jobs (Bartik & Houseman, 2007). In addition, "for the first time, workers

with a bachelor's degree or higher make up a larger portion of the workforce (36%) than

workers with a high school diploma or less (34%)" (Carnevale et. al, 2016, p. 4). From their

analysis of the data from the *Current Population Survey*, Carnevale and colleagues (2016) found

that the workforce with a high school diploma or less are losing access to both high-skilled jobs

and middle-skilled jobs in the United States' job market since the 2007 recession. In reaction to

their inability to gain employment in high-skilled jobs or middle-skilled jobs, more workers with

a high school diploma or less are having to settle for low skilled jobs that are accompanied with a

lower wage than prior to the recession (Carnevale et. al, 2016). Thus, the increased number of

employees with a high school diploma or less having to take lower wage jobs has increased the

wage disparity between American employees with a college degree and those with a high school

diploma in the current economy. As an example, Levy and Murnane (2013) found that the

discrepancy between the average wage for a 40-year-old American male with a bachelor's

degree compared to the average 40-year-old American male with a high school diploma had

grown from a weekly earning gap of twenty-six percent in 1980 to eighty-four percent in 2009.

In addition, Levy and Murnane (2013) found a very similar widening of the wage gap between

females with a college degree versus females with a high school diploma over approximately the

same time frame.

       United States' Job Market Shift. The shift in the job market for employees with a high

school diploma or less did not start with the 2007 recession and the United States' preceding

2010 economic recovery from the recession. "There has been a clear shift in job creation since

the second half of the 20th century towards industries that employ a high share of workers with

postsecondary attainment" (Carnevale et. al, 2016, p. 4). These changes have created the shift in

America's economy from a manufacturing economy that was fueled by a labor force dominated

by high school-educated workers to a global economy that is demanding a workforce where

almost two-thirds of the job market requires some sort of a postsecondary education (Carnevale

et. al, 2016). This shift to a globalized economy has impacted the United States' workforce

needs which resulted in a need for a workforce of employees that are either college graduates or

have some sort of postsecondary education attainment. For the United States to compete in the

global economy, "it is clear that education matters for growth and college matters most" (Uhalde & Strohl, 2006, p. 12).

The shift from a manufacturing economy to the global economy has impacted business and industry as a whole. The overall effects of the global economy on business and industry can be summed as the having the following effects: customer expectations have risen by constantly improving the customer experience; products enhanced via technological advances which increase the products' value; collaborative innovations merge the customer experience by using data that is constantly analyzed to improve the customer experience; and, organizational forms are providing a global platform through which new business models are being created (Schwab, 2015). These emerging business trends are causing businesses to become more innovative by combining technologies at a disruptive pace by creating a new market that eventually disrupts the existing product market.

Current and Projected United States Workforce Needs

The 2007 recession impacted the overall number of people in the United States' workforce that have a bachelor's degree or higher at a much higher rate that the United States Bureau of Labor Statistics projected over this time period in 2006 (Uhalde & Strohl, 2006). In 2016, the percentage of America's workforce with a bachelor's degree or higher outnumbered the workers in America's workforce that have a high school diploma or less (Carnevale et. al, 2016). The percentage of workers with a high school diploma or less has dropped five percent since the start of the recession which totals thirty-four percent of the workforce and the percentage of employees that have a bachelor's degree or higher has grown from thirty-two percent to thirty-six percent in the same time frame. In addition, the total workforce of

employees who hold an associate's degree or some college has risen to 65% of the United States'

workforce currently (Carnevale et. al, 2016, p. 15).

Analysis of Organization for Economic Cooperation and Development. The Bureau

of Labor Statistics [BLS] projected a total growth in the U.S. economy between 2010 to 2020 of

14.3% (Lockard & Wolf, 2012) and a growth of 10.8% between 2012 to 2022 (Richards, 2012).

Levy and Murnane's (2013) analysis of the BLS 2010 to 2020 report concluded that "the fasting

growing occupations [involved] unstructured problem-solving, working with new information,

and non-routine physical activity" (p. 16). The United States' education system is falling behind

other countries in producing a current workforce with the necessary skills to meet the projected

United States' labor demands to compete in the global economy.

In 2013, the Organization for Economic Cooperation and Development [OECD]

published a report called *OECD Skills Outlook 2013: First Results from the Survey of Adult*

Skills. The report compared the performance of American adults (16-65) to other participating

nations on a comprehensive survey of skills in three domains of literacy, numeracy, and problem

solving in technology known as the Programme for International Assessment of Adult

Competencies [PIAAC] (Goodman, Sands, & Coley, 2015). OCED identified the PIAAC

assessment of the three domains as "the key information-processing skills that are invaluable in

21st-century economies – and in various 'generic' skills, such as cooperation, communication,

and organizing one's time" (OCED, 2013, p. 3).

In all three skill domains from the PIAAC assessment, the United States adults ranked in

the bottom half compared to the other participating nations. In both literacy and numeracy,

twenty-two total countries participated in the PIAAC assessment. The United States' adults

ranked 13th in literacy and 18th in numeracy. For the problem solving in a technology rich

environment domain, American adults ranked fifteenth out of the nineteen participating countries (OCED, 2013). In the analysis of the OECD results, Madeline Goodman, Anita Sands, and Richard Conley (2015) stated "given the strong association that research has shown exists between the reading literacy and numeracy skills of a country's population and the well-being of and economic competitiveness of its people, such results are alarming" (p. 6).

In addition to the PIAAC results, there has been a continual decline in adult skill levels in literacy and numeracy which is additional cause for concern for the economic future of the United States. Trend data shows that there has been a steady decline in the United States' adult population in literacy since 1994, and there has been a steady decline in America's adult population in numeracy since 2003 (Goodman et. al, 2015). The decline in the skill levels of the United States' adult population brings into question how the U.S. will compete in the global economy, and in addition it brings into question "what kind of future [the United States] can construct when a sizable adult population…lacks the skills necessary for higher-level employment and meaning participation in our democratic institutions (Goodman et. al, 2015, p. 10).

2012 Millennials Performance on PIAAC Assessments. Further signs of concern can be seen when one examines the United States' "Millennials" generation performance on the 2012 PIAAC assessment. "Millennials" refers to the population born in the U.S. between 1982 and 2004, which represents approximately twenty-six percent of America's workforce. The Millennials will have a large impact on the United States' workforce of the future, and thus the millennials will have an impact on the economic fortunes of America for the foreseeable future (Goodman et. al, 2015). However, the Millennials' performance on the 2012 PIAAC assessment

compared to other participating countries is not encouraging for the United States' economic future.

Across all PIAAC domains: literacy, numeracy, and technology rich environments, the U.S. millennials performed poorly compared to other participating countries same population demographics. In literacy, millennials in only five participating countries scored lower, and in both numeracy and problem solving in technology, the U.S. millennials were outscored by all the participating countries (Goodman et. al, 2015). It is the problem solving in a technology rich environment that is most alarming due to the fact that it is estimated that "47 percent of employment is at risk due to automation and technological advances" (Patrinos, 2016, p. 2). In the global economy, automation will not only replace routine task in the work environment. Computerization is predicted to take the place of non-routine cognitive tasks in the U.S. workforce sector which will lead to new jobs, and thus, automation will create a demand for a highly technological rich, problem solving workforce (Patrinos, 2016).

For the United States to be successful in the global economy going forward, the U.S. must capitalize on leveraging the most effective use of its workforce. Currently, the United States has a mismatch in the demand of the skills needed to compete in the global economy and those skills that the American workforce actually possesses (World Bank, 2010). "Evidence from the United States shows that, as economies develop, the demand for interactive and analytical skills in the workplace increase steeply and continually, while that for manual and routine cognitive skills falls" (World Bank, 2010, p. 1). Thus, educational attainment of its current and future workforce is vital to America's economic future (Whitehurst, 2010).

Education Needs to Meet Workforce Demands

        Jeffrey Smink (2007) theorizes that "most of the world leaders agree that the key to

economic success in the global age is the development of innovative skills and products that can

be used all over the world" (p. 35). However, The National Center on Education and the

Economy report *Tough Choices or Tough Times* (2007) concludes that in today's global

economy most Americans do not have the type of high level education that has taught them to be

creative and innovative that is required to gain employment in the global economy. In addition,

the *Tough Choices or Tough Times* (2007) report concluded that companies in America are

competing with other countries in the global economy that can "offer large numbers of highly

educated workers willing to work for low wages" (p. 1).

        Changing education policies that govern curriculum and instruction in the United States

are essential to America competing in the global economy (Donner & Shockley, 2010; Smink,

2007; "Tough Choices or Tough Times," 2007) because "the core problem is that our education

and training systems were built for another era, an era in which most workers needed only a

rudimentary education" ("Tough Choices or Tough Times," 2007, p. 8). To compete in the

global economy, the country must "recognize the inexorable changes in the job distribution"

(Levy & Murnane, p.6, 2004) and must prepare the rising workforce with the skills need to

obtain the types of jobs that are in demand with the shift to a globalized economy. Not only is

this vital to an employee's social and economic advancement, but meeting the emerging

workforce needs is also a driving force to ensuring continued economic vitality of the United

States (Donner & Shockley, 2010). Donner and Shockley (2010) determine that meeting the

emerging workforce demands is contingent upon America's ability to produce "a well-trained

people and a steady stream of scientific and technical innovations that they produce" (p. 44).

The report *Tough Choices or Tough Times* (2007) says the global economy demands a United States workforce that can produce the newest and most important products and services. To ensure that the United States maintains the worldwide technological lead, business and industry will need a workforce that is continuing to constantly creating technological advances that people have never seen or imagined by

> "a myriad of people who can imagine how people can use things that have never been available before, create ingenious marketing and sales campaigns, write books, build furniture, make movies, and imagine new kinds of software that will capture people's imagination and become indispensable to millions" ("Tough Choices or Tough Times," 2007, p. 6).

Infusion of Information Technology's Impact on the United States' Workforce. The impact of the emerging infusion of information technology has altered industry's workforce needs. Computers process information more effectively than humans; thus, many jobs in the United States can now be done by either a computer or by workers who are located in countries that pay much lower wages than businesses in America (Shatkin, 2011; "Tough Choices or Tough Times," 2007). The increased infusion of automation has impacted both America's white-collar and higher-tier employment opportunities. The result was a change in workforce demand that has led to a change in the educational needs of the workforce. There is a new need for the workforce to not only have obtained a college degree, but now the workforce demand to compete in the global economy requires "higher-ordered cognitive skills in addition" (Levy & Murnane, 2004, p. 47) to the college education (Donner & Shockley, 2010). The higher-ordered cognitive skills that are a prerequisite for employees in the global economy has resulted in employers needing a workforce that is both "creative and flexible" (Donner & Shockley, 2010, p.

48) produced by America's colleges and universities to ensure there is a sustainable workforce to meet the needs required to compete in the global economy. To produce a workforce that is creative, flexible and innovative, America's public educational system must teach students to solve problems by drawing on their background knowledge from their formal education and their experiences throughout life (Donner & Shockley, 2010; Wagner, 2008).

To meet the rising workforce needs, America's public education curriculum must be constantly examined and realigned to ensure individual employee success in the new economy and national success in the competitive global marketplace. Tony Wagner's book *The Global Achievement Gap* (2008) concludes that public pK-12 schools in the United States are not "contributing significantly to this country's capacity for creativity, imagination, and innovation – any more than they are developing the problem-solving skills of our students" (p. 75). In contrast, other countries such as India, China and Singapore have committed to transforming their educational systems (Wagner, 2008) to ensure they produce creative students who will help their countries meet the changing workforce demands of the global economy (Smink, 2007).

United States' Government Response to Workforce Needs

In the early 20th Century, the United States built its modern educational system to meet the demands of an industrialized economy (Tucker, 2013). At that time, the United States' industries needed most workers to have basic literacy skills, a small portion of the workforce to have technical skills, and an even smaller number of workers that had either professional or managerial skills (Tucker, 2013). The educational system was designed to sort students so that only a small few would be given the opportunity to go to college (Tucker, 2013). College graduates were given the access to the country's highest paying jobs, but there was only a small demand for college graduates. With the emergence of technological advances that has created

the current global economy; the workforce demands have drastically changed. In the current

economy, workers with the same high skill levels are competing for jobs across the globe

(Tucker, 2013). Thus, it is imperative that the United States' current educational system produce

more high skilled workers.

In February of 2009 at his first joint address to Congress, President Barack Obama

challenged the nation by setting the goal for the United States to have the highest proportion of

college graduates in the world by the year 2020. To accomplish President Obama's goal, in 2011

the United States' Department of Education projected that America would have to increase the

proportion of its adults age 25 to 34 by 50% to ensure that America reached the President's goal

by 2020 ("The White House," 2011). This 50% increase was projected by the United States

Department of Education to be an additional eight million more people in America who obtained

an associate's or bachelor's degree ("The White House," 2011).

Education Reform Needed to Create a World Class Education System. To reach

President Obama's 2020 goal, there is a need to reform the United States' higher education

system ("The White House," 2011). In addition to education reform, the United States

Department of Education called for improved college readiness from K-12 schools, improvement

of the quality of the America's education systems from preschool to college graduation, and to

improve the percentage of college graduates by fifty percent ("The White House," 2011). As a

follow up to the 2009 Congress address, President Obama outlined his blueprint for building an

America economy that would thrive in the global marketplace in his 2012 State of the Union

Address. In his address, President Obama emphasized improving the rigor of America's

education system while at the same time customizing the educational pathway to ensure that

students are prepared to be successful in the global economy (U.S. Department of Education, 2012b).

In President Obama's plan to ensure the United States remains competitive in the global economy, he called for educators, public officials, and policymakers to ensure every student graduates from high school with the necessary skills to be prepared for college and their successful career. In addition, President Obama called for every student to have access to a college course or postsecondary training at an affordable cost prior to graduating from high school (U.S. Department of Education, 2012b). The result of this collaboration of educators, public officials, and policymakers would create "a world-class educational system that provides high-quality job-training opportunities (that) will reduce skill shortages, spur business growth, encourage new investment and hiring, spark innovation, and promote continued economic growth" (U.S. Department of Education, 2012b, p. 1).

Call for the Reauthorization of the Carl D. Perkins Career and Technical Education Act. For the United States' government, transforming America's career and technical educational system was essential in strengthening America's economic outlook. In 2012, the U.S. ranked ninth in the world in the proportion of young adults (age 25-34) enrolled in college and ranked sixteenth in the world of young adults who obtained certifications or degrees (U.S. Department of Education, 2012b). In addition, the United States government recognized that investing in career and technical education played a critical role in investing in America's economic future (U.S. Department of Education, 2012a).

To address the inadequacies in America's career and technical education system and its alignment to postsecondary education and workforce needs, the Obama administration outlined a four-part plan to address career and technical education for the future. The plan called for

increased alignment, collaboration, accountability, and innovation (U.S. Department of Education, 2012a; U.S. Department of Education, 2012b). Through improved alignment with career and technical education and workforce demands, the revised career and technical education plan emphasizes the need to equip students with 21st century skills that are defined as the most important behavior skills that include problem solving, fluid intelligence, teamwork, achievement/innovation, and communication skills (Burrus et. al, 2013).

In addition, the Obama plan calls for strong collaboration between secondary education, postsecondary education, and industry partners to improve the quality of career and technical education to ensure the success of the graduates in the new economy. To improve the academic outcomes of the career and technical education graduates in terms of technical and employability skills, the plan called for increased accountability through common workplace definitions and metrics for performance in the global economy. Finally, the plan placed a high priority on innovation supported by systemic reform of state policies and local practices to ensure effective implementation of the career and technical graduates directly into the workforce (U.S. Department of Education, 2012a; U.S. Department of Education, 2012b).

Through a $1 billion investment in the United States government's 2013 fiscal year budget the government placed a strategic and critical emphasis on the reauthorization of the *Carl D. Perkins Career and Technical Education Act* (U.S. Department of Education, 2012b).   By investing in career and technical education, the government's vision was to not only align career and technical education with college and career readiness standards, but also to align career and technical education with the needs of the United States' industry to compete in the global economy (U.S. Department of Education, 2012b). U.S. Secretary of Education Arne Duncan stated in his April 19, 2012 press release that

"in the knowledge-based economy, lifelong learning is so critical. And that means that

the traditional mission of career and technical education has to change…it can no longer

be about earning a diploma and landing a job after high school. The goal of CTE should

be that students earn an industry certification and postsecondary certificate or degree —

and land a job that leads to a successful career" (para. 3).

The result of the United States government's $1 billion commitment to career and

technical education in 2012 was hailed as a "commitment in promoting equity and quality" (U.S.

Department of Education, 2012a, p. 2) due to the fact that the educational experiences of

minorities (students of low socioeconomic status, students of color, students with disabilities)

experience an attainment gap in regards to completing college successfully. This lack of

educational experiences is due to the insufficient enrollment in postsecondary opportunities for

minorities, which leads to the lack of minorities graduating with associate's or bachelor's

degrees. In addition, the U.S. Census Bureau projects minorities groups to grow faster than their

White non-Hispanic counterparts (Kelly & Prescott, 2007). This attainment gap that is being

created by these population trends has led to a growing income gap between students from

America's middle to high socioeconomic families and those who are classified as minorities or

live in poverty (Bartik & Houseman, 2007; U.S. Department of Education, 2012b). Thus, this

investment in America's career and technical education system is vital to ensure the United

States succeeds in President Obama's initiative to increase the number of college graduates by

fifty percent by 2020 ("The White House," 2011).

Impact of the Global Economy on United States' Cities and Communities

With the globalization of the world's economy, America's cities and communities have

seen a massive shift "in the spatial geography of innovation" (Katz & Wagner, 2014, p. 1).

Previously, innovation in America was primarily isolated to suburban areas that housed computer companies and computer chip manufactures (Katz & Wagner, 2014). However, the advances that have been seen over the last couple of decades in informational technology have linked the world creating global relationships (Mabogunje, 2002). These global partnerships have linked companies from distant parts of the earth and have created global corporations that work together to develop changes in manufacturing organization and faster advancements in technology (Mabogunje, 2002).

Innovation Districts. The impact of globalization and the global economy have led to a rise in what is being called "innovation districts" across the United States. Innovation districts are being defined as "geographical areas where leading-edge anchor institutions and companies cluster to connect with start-ups business incubators, and accelerators" (Katz & Wagner, 2014, p. 1). The rise in innovation districts has altered the location preferences of America's workforce. Many innovation firms which attract the United States' most talented workers have chosen to leave the isolated suburban areas and cluster together in the downtowns or cores of major U.S. cities. This clustering effect has increased the number of entrepreneurs who are seeking collaborative spaces in these large U.S. cities where they can collaborate with each other and have access to resources needed to compete in the global economy (Katz & Wagner, 2014).

Innovation districts across the United States customize to each metropolis by leveraging the distinctive advantages of each city's economic, physical, and networking strengths (Katz & Wagner, 2014). This strategy has shown increased economic growth after the 2007 recession. Innovation districts are growing jobs "in ways that both align with disruptive forces in the economy and leverage their distinct economic positions" (Katz & Wagner, 2014, p. 4). In addition, these districts are attracting entrepreneurs which are resulting in both economic growth

and job creation within the communities. The job growth created by innovation districts have

given more access to higher wage jobs for disadvantaged workers (Katz & Wagner, 2014).

Thus, innovation districts are altering the trends of rising poverty and social inequality within

these communities (Katz & Wagner, 2014).

The emergence and growth of innovation districts is positively impacting metropolitan

areas but has the potential to negatively impact small towns or rural communities that need a

highly educated workforce to compete in the global economy. Using the 2014 data from the

American Community Survey, *The City Observatory* found that the number of young college

graduates between the ages of 25 to 34 living within three miles of America's 51 metropolitan

areas with a population of one million or more where innovation districts are springing up has

increased 37 percent since 2010 (Cortright, 2014). These young adults are attracted to "vibrant

neighborhoods that offer choices in housing, transportation, and amenities" (Katz, Vey, &

Wagner, para. 4). Thus, the United States' metropolitan areas are attracting young, talented

workers. These talented young workers are vital in today's economy because they are equipped

to meet the fast-growing knowledge-based workforce demands (Cortright, 2014). However, this

population migration of talented young highly educated workers puts further stress on how small

towns and rural communities are going to compete with large metropolitan areas in the United

States for workforce talent (Sassen, 1996).

Changes Needed for pK-12 Education

To meet the educational attainment demands and workforce skills needed in the global

economy, one needs to analyze America's current public education system. In 2013 Marc

Tucker concluded in *Governing American Education* that when the United States' modern

educational system was built approximately a century ago, it was designed to meet the needs of a

mass-production industrialized nation. The labor force needs demanded basic literacy for most

of the workforce. Technical skills were needed for a small portion of the workforce, and even

less of the workforce demand required managerial skills (Tucker, 2013). In today's economy,

the need for highly skilled workers has increased dramatically since America's educational

system was designed. "The global economy has now evolved so that people with the same skill

levels are competing directly with each other across the globe" (Tucker, 2013, p. 9). In today's

economy, workers and companies are connected across the globe which drives the competition

for jobs in the United States. Not all companies are vertically aligned. "A century ago, the

United States led the world in the process of vertical integration, where corporations performed

every function necessary to get their products to market" ("Tough Choices or Tough Times,"

2007, p. 5). Instead companies look for ways to outsource sectors of their jobs to workers in

areas across the globe which allows them to reduce production costs ("Tough Choices or Tough

Times," 2007).

Workers with the same skills are competing with other workers with the same skills

across the world. Nations across the globe are being affected because of this global competition

for jobs ("Tough Choices or Tough Times," 2007; Tucker, 2013). This is causing high average

wage nations to take notice that their citizens are finding that their standards of living are

declining as the workers are competing with similarly skilled workers around the globe (Tucker,

2013). The solution that many world leaders have recognized is that the only way of reversing

the trend of declining standards of living is to, in effect, raise the skills of the entire population of

their nation (Tucker, 2013). Therefore, the only way to raise the skill levels of the workforce to

positively impact their citizens' standards of living is to provide a high quality education to all of

their people so they can compete for jobs (Tucker, 2013). Obtaining a high quality and level of

education has in essence moved from being one of the ways to gain upward mobility to the main

source of upward mobility for citizens across the globe (Levy & Murnane, 2013).

"Top-performing countries have all developed world-class instructional systems focused

on the acquisition of basic skills, complex skills, the ability to apply what one knows to

unforeseen real-world problems and the capacity for creativity and innovation" (Tucker, 2013, p.

9). However, one needs to understand that in a learning continuum advanced skills build off of

other simpler foundational skills. The ability for a worker to acquire the job-related skills or

knowledge depends largely on the foundational skills that the worker has already required. The

global economy demands a workforce "in which a very high level of preparation in reading,

writing, speaking, mathematics, science, literature, history, and the arts will be an indispensable

foundation for everything that comes after for most members of the workforce" ("Tough Choices

or Tough Times," 2007, p. 6). Therefore, it has become imperative that the pK-12 educational

system in the United States provide students the foundational skills and knowledge to be

successful in today's global economy because "the global education race is now a race to provide

elite results for all students" (Tucker, 2013, p. 8).

In previous centuries and decades, the United States relied on public education to ensure

that children born into disadvantaged households compared to their peers had the opportunity to

overcome their difficult beginnings (Levy & Murnane, 2013). The U.S. educational system has

been successful in the past in providing most children with strong foundational skills, but the

global economy has changed the education level of attainment that all students need. In a

longitudinal analysis of the National Assessment of Educational Progress [NAEP], Levy and

Murnane (2013) state that the long-term NAEP assessments "show that most American students

now master foundational skills as defined 40 years ago – for example, reading well enough to

follow directions" (p. 27). However, the challenge that the American pK-12 educational system faces now is that the need to produce a workforce that will help the United States compete in the global economy has greatly increased the complexity of the foundational skills that all children need. However, "teaching today's foundational skills requires changing how core subjects are taught, with increased emphasis on conceptual understanding and problem-solving" (Levy & Murnane, 2013, p. 27).

No Child Left Behind's Impact on Public Education. The United States' primary strategy to improve the educational skills of all students has been focused on holding schools and state accountable with the *No Child Left Behind* [NCLB] policy passed in 2001. The NCLB federal legislation was designed to focus attention on all students' academic skills attainment levels, and then impose sanctions on schools or school systems that did not improve students' reading and mathematics proficiency levels over defined time periods. Each state was allowed to designate the level of attainment that equated to proficiency; therefore, allowing states to set their own benchmarks for proficiency resulted in a modest positive effect on the pK-12 education attainment levels when compared to the NAEP proficiency standards (Levy & Murnane, 2013).

Using the estimated NAEP scale equivalency scores for each state for reading and mathematics in 2009, the analysis displays a major disconnect from state proficiency standards and NAEP proficiency benchmarks (U.S. Department of Education, 2011a). "Most states' proficiency standards are at or below NAEP's definition of Basic performance" (U.S. Department of Education, 2011a, p. 2). The NAEP assessment defines three levels for reading and mathematics: Basic, Proficient, and Advanced. In analyzing eighth grade reading, there were no states that defined proficiency at or above the NAEP proficiency benchmark (U.S. Department of Education, 2011a). In addition, there were seventeen states that defined

proficiency of their state approved NCLB assessments below the NAEP basic level in eight

grade reading (U.S. Department of Education, 2011a). In analyzing eighth grade mathematics,

one state defined proficiency above the NAEP proficiency benchmark (U.S. Department of

Education, 2011a). Thirteen states defined proficiency of their state approved NCLB

assessments below the NAEP basic level in eighth grade mathematics ("NAEP Nations Report

Card - The NAEP Mathematics Achievement Levels by Grade," 2016; "NAEP Nations Report

Card - The NAEP Reading Achievement Levels by Grade," 2016; "NAEP State Mapping - Table

1: Estimated NAEP scale equivalent scores for state proficiency standards, by subject, grade, and

state: 2009," 2016; U.S. Department of Education, 2011a).

In 2011, the U.S. Department of Education concluded in its study *Mapping State*

Proficiency Standards onto the NAEP Scales that "mapping state standards for proficient

performance on the NAEP scales showed wide variation among states in the rigor of their

standards" (U.S. Department of Education, 2011a, p. 27). Thus, there is a large discrepancy in

how students are being evaluated against proficiency standards in reading and math across the

United States (U.S. Department of Education, 2011a). In reference to the United States 2009

NAEP scores, U.S. Secretary of Education Arne Duncan, said that the results "are a call to action

to reform the teaching and learning of mathematics and other related subjects in order to prepare

our students to compete in the global economy" (U.S. Department of Education, 2009, para. 3).

Development and Implementation of the Common Core State Standards. The recent

development of the Common Core State Standards [CCSS] has the potential to improving

America's pK-12 education attainment for the United States. The CCSS were developed through

a long drawn out process that started in 2008 (Bidwell, 2014), and the idea for the standards was

actually birthed by then Arizona Governor Janet Napolitano who was serving as the chair of the

National Governors Association [NGA] at that time. In Governor Napolitano's published NGA

initiative, the Governor called for a strong improvement of the math and science standards in the

United States as well as workforce readiness for all students (Bidwell, 2014).

Through her call for educational improvement in her published NGA agenda, the NGA

was able to collaborate with the Council of Chief State School Officers [CCSSO], which led to

the development of the CCSS. In addition to NGA and CCSSO working together on the

standards, other organization such as the International Reading Association, The National

Council of Teachers of Mathematics, the National Education Association, and the American

Federation of Teachers were used to gain valuable input on the standards (Bidwell, 2014).   In

addition to these organizations, 48 different state governors and state education commissions

collaborated on the development of the CCSS ("Corestandards.org," 2015). As a guide, the

collaborative group used newly developed standards by the states of Georgia and Colorado

(Ascd.org, 2015). In addition, the collaborative group actively sought stakeholders throughout

the development process to gain valuable feedback. The process also actively engaged teachers

and professional organizations by asking for feedback on drafts of the standards prior to and

during a public comment process of the standards by putting the drafts and ultimately the final

draft online (Corestandards.org, 2015). Through the entire development process of the CCSS,

there were over 10,000 comments, questions, and concerns that were reviewed and responded to

during the process (Bidwell, 2014).

As a result of the CCSS collaborative process, the result was a set of academic standards

that are internationally benchmarked against the best educational systems in the world (National

Governors Association, the Council of Chief State School Officers, and Achieve, Inc., 2008).

The international benchmarking process provided a way for the United States to "understand

relative strengths and weaknesses of their education system and identify best practices and ways

forward" (National Governors Association, the Council of Chief State School Officers, and

Achieve, Inc., 2008, p. 19). The CCSS were developed using research that correlated with what

every student needs to learn to be prepared for postsecondary education and the global workforce

(Ascd.org, 2015), and the standards provide a common learning expectation for the United States

from state to state. Currently, 44 of the states in America have adopted the standards and have

implemented the standards or are in the process of implementing the standards ("Common Core

State Standards Adoption Map - Academic Benchmarks," 2016). In 2010, the U.S. Secretary of

Education Arne Duncan said that the CCSS "will help teachers, students and parents know what

is needed for students to succeed in college and careers, and will enable states, school districts

and teachers to more effectively collaborate to accelerate learning and close achievement gaps

nationwide" (Ascd.org, 2015, "What Are the Common Core Standards," para. 4).

Need for pK-12 Schools to Graduate Students College or Career-ready. Despite the

opportunity for success that the CCSS brings, a 2016 report by the National Center on Education

and the Economy entitled *What Does It Really Mean to be College and Work Ready?* warns that

only a large fraction of America's current high school graduates entering postsecondary schools

cannot do all of the typical first year work at a community college. Thus, it is imperative that

pK-12 schools be held accountable for ensuring that their high school students graduate either

college and/or career-ready. "States are making great strides in advancing policies to support

college and career readiness through adoption and early stage implementation of college- and

career-ready standards, delineation of graduation requirements and alignment of assessments to

college- and career-ready performance" (Achieve, Inc., 2013, p. 1). Only five states in America

have reinforced the college and career readiness standards implemented by state legislation by

including these measurements in their state educational accountability systems. States must

focus on these indicators to ensure that they improve their students' overall college and career

readiness. The college and career indicators are "critical determinants of students' later

likelihood of success" (Achieve, Inc., 2013, p. 4).

Need for P-20 Educational Aligned Systems. "Successful completion of some

postsecondary education is increasingly important in today's global economy" (Cohen, 2008, p.

21). Achieve, an independent, bipartisan, nonprofit education reform organization of governors

and business leaders that grew out of the 1996 National Education Summit, created *The*

American Diploma Project report that focuses on how to use research and educational policy

analysis to help states improve their pK-12 public education systems to postsecondary education

and careers (Cohen, 2008). In 2013, *The American Diploma Project* report recommended that

states should use student performance indicators throughout what it calls the "P-20 pipeline" in

the "interest of coherence, alignment, and efficacy" (p. 3). A P-20 pipeline is defined as a local

focus of states and districts on the continuum of educational attainment from preschool to the

start of a career in local community or state. Using the performance indicators identified along

the P-20 pipeline will alleviate the "disconnect of academic expectations between postsecondary

education and K-12" because the "separate systems of K-12 and higher education fail to provide

both clear and accurate signals about the knowledge and skills students must acquire and a

seamless transition from one system to the other" (Cohen, 2008, p. 8). The goal as described by

The American Diploma Project report is to drive all students towards college and career

readiness. To achieve this, state educational agencies or state government should select

educational indicators that measures "students' course completion and success, achievement and

attainment through PK-12 and postsecondary education" (Achieve, Inc., 2013, p. 3).

In 2014, Perna and Armijo concluded that there is an absence of academic readiness for college due to the fact there is an absence to a P-20 approach to education, and the lack of evidence of the P-20 approach is driven by the continued lack of curricular alignment requirements and assessments between pK-12 schools and higher education. Perna and Armijo (2014) stated "because high schools and colleges have historically developed their curriculum and assessments separately, and because K-12 and higher education governance, policymaking, and finance functions are generally not coordinated, many high schools in most states have been preparing students to receive a high school diploma but not necessarily to be academically ready for college" (p. 17).

In an effort to align states to a P-20 continuum of education attainment for all students, states and schools need to develop processes to monitor student achievement along their educational journey from pre-school to high school graduation and then the transition from secondary schools to postsecondary schools, and finally the transition from postsecondary schools into the job market. For pK-12 schools, analyzing student success scores throughout a student's educational pathway help inform public educators to make decisions that positively impact a student's achievement.   Using the data obtained from students' scores, educators can make informed decisions on academic and non-cognitive supports or interventions that the student will need to ensure they graduate high school college-ready as defined by national college entrance exams' benchmarks for college success. (Achieve, Inc., 2013). The indicators chosen should "reflect when students are on-track *towards* readiness, when they have *met* readiness and whey they have *exceeded* readiness" (Achieve, Inc., 2013, p. 3).

By using these indicators of college readiness, the information will help educators and schools to make informed decisions will help create a systematic approach to improving student

achievement based on college readiness benchmarks. Creating a systematic pipeline focused on measuring college readiness benchmarks and then implementing supports or interventions for students who are not on track to become college-ready is crucial to helping students who fall in the national achievement gap based on their socio-economic status, race or ethnicity, or disability (Achieve, Inc., 2013). "The pipeline strategy becomes even more essential as states transition to the Common Core State Standards (CCSS) where knowledge, skills and practices in each grade level clearly build on the grades before" (Achieve, Inc., 2013, p. 4).

        School Readiness Indicators for P-20 Pipeline. For school readiness indicators, the National Early Childhood Accountability Task Force has called for indicators that schools and states are held accountable from prekindergarten through third grade that measure a student's school readiness. School readiness measures are critical for children because a student's performance in the first initial years of public schooling is "associated with (but not determinant of) later outcomes in school" (Achieve, Inc., 2013, p. 5). In addition, the indicator measurement can be used to provide focused supports and interventions to children at an early age to ensure a student in effect catches up to grade level standards that are aligned to college readiness standards upon high school graduation. The three most crucial indicators for early childhood success that are indicators of being on track to being college-ready are the measures of the percentage of students who are proficient in reading assessments aligned with the CCSS in grades K-2, percentage of students proficient in English language arts/literacy assessments aligned with CCSS in grade 3, percentage of students proficient in mathematics assessments aligned with CCSS in grade 3, and percentage of students proficient in mathematics assessments aligned with CCSS in grade 5 (Achieve, Inc., 2013).

The readiness indicators recommended by *The American Diploma Project* report begins with assessing the percentage of students who are proficient on CCSS aligned assessments in mathematics in fifth grade to analyze the number of students who will be on track to being college-ready in mathematics at the beginning of high school. In addition, the report recommends that the percentage of students failing mathematics and/or English language arts at sixth grade should be monitored. By using sixth grade course failures as a performance indicator for high school readiness, educators can focus on academic support and indicators for the students who are not passing key courses (6th grade English language arts and mathematics); and, the educational system can leverage community partners to help deliver the academic supports and interventions in addition to the work being implemented in schools to ensure that the students get the needed academic support to continue to progress towards college readiness benchmarks by the end of high school. Finally, the percentage of students who have a "C" or better in their eighth grade mathematics courses that is aligned with the CCSS or Algebra 1 should be a metric that is analyzed to predict college readiness (Achieve, Inc., 2013).

College Readiness Indicators for P-20 Pipeline. High school graduation rates do not serve as the leading indicator for college success for public schools. Across the 50 states in America, differences in course requirements for graduation from state to state create irregularities when comparing graduation rates from different states. The irregularities in comparing high school graduation rates cause graduation rates to not be a leading indicator of college success. As an indicator for college success, states and districts should be focused on the percentage of their students who graduate with a college or career-ready diploma. To determine the percentage of students who are graduating with college or career-ready diploma, states need to have college and career-ready assessments that are aligned with the benchmarks for college

success as defined by pre-college entrance exams such as the ACT or SAT. These college

benchmarks are grounded in research that colleges and universities use for placement into first-

year college credit-bearing courses or by business and industry for hiring purposes. To calculate

the percentage of students who are either college-ready or career-ready as defined by the

assessments, the total number of students who are college or career-ready should be divided by

the total number of graduates in their grade level cohort. The percentage of high school

graduates who are either college or career-ready should be used in the state accountability model

to ensure that schools and districts are held accountable for reaching the college and career

readiness thresholds (Achieve, Inc., 2013).

In addition to the college and career readiness assessments aligned with the CCSS

throughout pK-12 education, schools and states need to increase the number of high school

students who earn college credit while enrolled in high school. "Students who earn college

credits while in high school are more likely to enter college and succeed when they do [enter

college]" (Achieve, Inc., 2013, p. 15). Through the experiences of earning college credit while

still enrolled in high school, students gain insight into the demand of college course work and

valuable knowledge about the culture of postsecondary education. In addition, this experience is

invaluable to low socioeconomic students who start to build their identity as a college student

and confidence in their ability to overcome their current low socioeconomic upbringings.

Earning college credit should be measured by the percentage of students in a graduating cohort

of high school students who either earn a passing score on Advanced Placement or International

Baccalaureate classes or earn a "C" or higher in a dual enrollment college course (Achieve, Inc.,

2013).

The reality is that not all students will choose to enter college directly after graduating

high school. For these students, they "should leave high school with the academic, technical and

employable skills needed to enter careers with a family-sustaining wage and pathways to

advancement" (Achieve, Inc., 2013, p. 17). Schools and states should use the indicator of the

percentage of high school students who graduate in the cohort who complete a state approved

career and technical education course sequence and who successfully pass an industry-based

assessment. Local and state businesses can rely on the percentage of students who graduate

career-ready as defined by this measure to evaluate schools in the local communities or the state

overall (Achieve, Inc., 2013).

Changes Needed for Postsecondary Education

State boards of educations who govern pk-12 public education need to evaluate the

academic outcomes of high school graduates after they enter college to have a clear vision of the

success of pk-12 educational attainment throughout the state in the P-20 pipeline or from cradle

to career as defined in Kentucky ("Kentucky Rising Fact Sheet," 2015). This analysis will

provide critical insight into future policies and practices of pK-12 education in the state. The

first indicator that state boards of education need to evaluate is the percentage of high school

graduates who enter college and are required to take remedial classes in reading, writing and/or

mathematics. Remedial college classes are mandatory classes that students have to take to

elevate their skill level in the specific subject; however, these classes cost the student college

tuition, and the remedial classes do not count towards college degree completion (Achieve, Inc.,

2012). The report *Remediation: Higher Education's Bridge to Nowhere* found that only thirty-

five percent of college students who take a remediation course earn a bachelor's degree within

six years compared to over fifty-five percent who earn a bachelor's degree within the same time period who do not take remediation courses (Complete College America, 2012).

In addition to the remediation metric, the measure of students who enroll in college within 16 months after graduation and then complete one full year of coursework within a two-year period should be monitored by college and universities to ensure students who are in jeopardy of not progressing receive the proper interventions or supports. It is imperative that students who enter college have success towards their degree completion early in their collegiate careers. Finally, the percentage of students who enter into postsecondary schools and complete their degree requirements within 150% of the custom degree requirement time should be monitored. This indicator has the "greatest meaning for students' ultimate job prospects and earning potential" (Achieve, Inc., 2012, p. 20). The collegiate degree completion indicator provides the most insight into a student's earning potential for their lifetime (Achieve, Inc., 2012).

Evidence shows that in the current economy there is more than just advanced degree completion that is needed by today's workforce participants (World Bank, 2010). With the increase of technology, evidence points to the fact that there is an increase "demand for non-routine problem-solving skills and a variety of interactive skills" (Murnane, 2009, p. 2) in the global economy. This makes meeting the demands of the technological evolving global economy difficult because "the skills needed to teach all students to excel at expert thinking and complex communication are greater than those required to prepare students to work effectively in jobs that consisted primarily of following directions" (Murnane, 2009, p. 4). In 2006, the United States Department of Education report *A Test of Leadership: Charting the Future of Higher Education* (2006) warned that "better data about real performance and lifelong working

and learning ability is absolutely essential if we are to meet national needs and improve institutional performance" (p. 13).

Workforce competencies needed of college graduates. Human capital in the form of skills, competencies, and attitudes are essential prerequisites that will drive a country's economic growth in the global economy (Goodman, Sands, & Coley, 2015). "Therefore, understanding how we gain skills, and what levels of skills we have – not just in K-12 education, but also in formal higher postsecondary institutions and informal education – is critical to grasping how our economy functions and how individuals within our society rise and fall with the shifting demands of the global marketplace" (Goodman et. al, 2015, p. 20). America's economic future rests on identifying the specific skills needed by America's workforce to ensure that America's education system teaches these skills to its students. It is vital that within the postsecondary education system in the United States, educational leaders, politicians, and business leaders identify the specific skills that are needed most by America's future workforce to ensure the United States has the ability to compete in the global economy (Goodman et. al, 2015).

In a research report published in 2013, the Educational Testing Service [ETS] identified the five most important skills needed by college graduates to succeed in the knowledge economy. The research report entitled *Identifying the Most Important 21st Century Workforce Competencies: An Analysis of the Occupational Information Network* [O*NET] conducted an analysis on the U.S. Department of Labor's Occupational Information Network where ETS analyzed O*NET's rating of importance of abilities (52 different ratings), work styles (16 different ratings), skills (35 different ratings), and knowledge (33 different ratings) to determine the most important competencies to succeed in America's workforce in the 21st century (Burrus et. al, 2013). In their analysis on the U.S. Department of Labor's O*NET workforce attributes,

Burrus and colleagues (2013) concluded that there was a skill gap between college graduates'

skills and 21st century workforce needs being created by the possibility "that both student's

expectations for what they must learn and schools' expectations for what they must teach have

not adapted quickly enough to changes in the economy and the way business is done" (p. 1).

Thus, the shift to an informational, computerized global economy has created a shift in the skills

that are demanded of the United States' workforce participants. However, the entire P-20

American educational system has not adjusted at a rate to keep up with the demand of the global

economy (Burrus et. al, 2013).

Using three different frameworks to identify and define 21st century skills, Burrus et. al

(2013) conducted a descriptive analysis on the O*NET job database that has been maintained

since 1993 and last updated in 2010 by the U.S. Department of Labor for competencies needed

for the 21st century. Once the descriptive analysis was conducted, the data was separated into

two sets as identified by the O*NET theoretical structure. Next, the research study conducted a

principal component analysis on both of the data sets. From the principal component analysis of

the two data sets, Burrus et.al. identified fifteen different components that were ranked by

importance by analyzing the mean component scores for over all of the identified occupations in

the O*NET database. Finally, the researchers compared the rankings with the three different 21st

century frameworks to identify the five most important competencies as the most critical for

America's 21st century workforce to possess. From this research analysis, the researchers

concluded that the five most important skills that America's workforce must possess to compete

in the global economy for most occupations are: problem solving, fluid intelligence, teamwork,

innovation, and communication skills (Burrus et. al, 2013). Due to geographical differences that

create different workforce demands across America, there are no ideal national educational

reform packages that will customize pre-employment training to each specific workforce demand across the country. The challenge that lays ahead for America to compete in the global economy is to create systems that provide incentives to both the local educational systems and the local businesses and industries that respond to the local needs of their labor market demands (World Bank, 2010).

Educational Engineering Solution

Preparing students to be successful in the global marketplace is contingent upon America's public schools preparing all students to help serve the private sector interests and America's economic future (Donner & Shockley, 2010). While an education system that is strong in content and teaches the skills of problem-solving and critical thinking is needed to compete in today's economy, schools and communities need educational partners to help students focus on real-world problems (Smink, 2007). Public schools need other educational partners "such as community-based organizations, recreation centers, camps, science centers, libraries, museums, and universities" to create a "broader, more expansive view of learning" (Smink, 2007, p. 46) to ensure that America is producing the workforce that is needed to compete versus other countries across the globe. America will not prepare students for the global marketplace by using the former educational structures and methods of the past. Instead, America must morph its public education system into one that produces technological sound students with higher levels of academic knowledge than previous generations to ensure its success in the global economy (Smink, 2007).

The countries where national leaders have realized that the only way to compete in a global economy and have high-wage jobs without losing national standards of living rates have committed to redesigning their mass educational systems (Tucker, 2013). Analyzing the

countries with the most successful education systems, the report *Governing American Education* (2013) by Marc Tucker determined that building an educational system that allows a country to be successful in the global economy "is a kind of engineering job, in the sense that all the parts and pieces of national and state education systems have to be redesigned to bring this off, and they have to be redesigned so that those parts and pieces fit together and reinforce each other" (p. 9). Further evidence from Tucker's report showed that these same national education systems were focused on all students acquiring basic skills, complex skills, and the ability for a person to take what they know and apply it to an unknown real-world problem by using creativity and innovation (Tucker, 2013).

In today's global economy the focus of the United States' educational system is on postsecondary educational attainment; however, the United States has seen its percentage of adults with a postsecondary degree attainment fall relative to other countries (Kelly & Prescott, 2007; Rippner, 2014). The decrease in postsecondary degree attainment compared to others is hypothesized to be created by "organizational disjuncture between K-12 and higher education sectors, which presents seamless and successful transitions from high school to college" (Rippner, 2014, p. 2).   In addition, there is evidence that there is a disjuncture between college and the workforce (Burrus et. al, 2013) because other countries have improved the educational attainment of their youth at "rates unmatched by the United States (Kelly & Prescott, 2007, p. 34).

In the past two decades, several states have tried to remedy the disconnect between pK-12 education and postsecondary education through curriculum alignment, accreditation of public and private secondary schools, and by state legislation that has sought to streamline state governance structures of education within the states (Kirst, 2005). These implemented solutions

have brought some success throughout the United States, however none of these solutions has

produced significant results to ensure all or most of their students have achieved success in the

current American educational system (Kirst, 2005). However, "the global economy is here to

stay, with recent research suggesting that it is evolving and its impact intensifying at a stunning

pace" (National Governors Association, the Council of Chief State School Officers, and

Achieve, Inc., 2008, p. 5). A higher level of educational attainment for all students is

"tremendously important lever for ensuring competitiveness and prosperity in the age of

globalization" (National Governors Association, the Council of Chief State School Officers, and

Achieve, Inc., 2008, p. 5).

In an effort to align state resources, several states have implemented P-20 councils in an

effort to achieve a seamless transition from secondary to postsecondary schools within the states

(Rippner, 2017). These P-20 councils have focused on both communication between the

secondary and postsecondary schools and aligning the state policies that govern them. The P-20

councils are composed of educational stakeholders from within the state, and the focus of their

work is on discussing statewide educational issues and solutions to the issues within the state

(Rippner, 2017). The national Education Commission of States comprised of both state

education and political leaders lists the following advantages of P-20 state councils: opportunity

to bring together and build consensus among different state educational partners impacted by the

P-20 movement (pK-12, postsecondary colleges, politicians, and business leaders); opportunity

to influence decisions in the best interest of the state's youth; and, the ability to create monetary

efficiencies in the educational pipeline (Rippner, 2014).

P-20 councils have been implemented in states as a popular policy mechanism to enhance

pK-12 and postsecondary education collaboration to ensure states have the opportunity to

overcome state education attainment issues by connecting separate sectors of the educational

pipeline (Rippner, 2015). States that have implemented P-20 councils have created a positive

effect on states' educational alignment efforts by improving communication between pK-12,

postsecondary, business, and political leaders through stateside advancement of a P-20 agenda

(Perna & Armijo, 2014). However P-20 council collaboration remains disappointing to some

participating states, even though it is believed to have the potential to help states achieve their

educational goals (Rippner, 2014). There "is little empirical data to know whether [P-20

councils] are, in fact, effective and in what form" (Rippner, 2014, p. 2), and the ineffectiveness

of P-20 councils has been contributed to the fact that the P-20 state leaders spend too much time

discussing and planning initiatives rather than implementing P-20 action plans that have a

significant impact on student achievement throughout the state (Finney, Perna & Callan, 2014;

Shulock, 2009a).

Rippner's (2014) study of P-20 councils found that the "most often cited outcome [of P-

20 councils] was strong relationships" (p. 27). These strong relationships have led to greater

communication, and the establishment of P-20 councils produces state policies that are immune

to both political and leadership transitions that creates a more stable and sustainable education

improvement agenda for states (Rippner, 2004). By creating policies that can withstand political

change and personal agendas, P-20 councils help states across America build an educational

alignment system that ensures that every citizen is prepared for the global economy ("Preparing

Every Citizen for the Knowledge Economy," 2012). To ensure every citizen has the opportunity

to gain the knowledge and skills needed to compete in today's job market "requires

unprecedented alignment of policies and practices across the early childhood; elementary,

secondary, and postsecondary education; and workforce sectors" ("Preparing Every Citizen for the Knowledge Economy," 2012, p. 2).

  Implementing P-20 Systematic Solutions. Implementing a P-20 continuum that transitions citizens through pK-12 education to college and then from college into the American workforce across the United States is imperative for America's success going forward in the global economy. "The economic future of the nation and the prospects of many of our citizens depend on returning the United States to the forefront of educational attainment" (Whitehurst, 2010, p. 1) in the world. However, the United States has "not been successful in the past at enrolling and graduating individuals who come from certain segments of our population – the segments that also turn out to be those growing the fastest" (Prescott, 2007, p. 34). Currently, there are large gaps in educational attainment as measured by postsecondary degrees of white non-Hispanic and Asian citizens compared to African-Americans, Hispanics and Native Americans citizens (Prescott, 2007). Failing to reverse this trend in the American education system will further widen the achievement gap within the United States' based on race, ethnicity, and socioeconomic status (Futrell, 2010). This divide "will result in growing numbers of Americans not acquiring the knowledge and skills they will need to thrive in our digital-aged, knowledge-based, and multicultural global economy" (Futrell, 2010, p. 439).

  While P-20 councils and state initiatives have helped state political and educational leaders' recognize the lack of alignment and collaboration in the traditional United States educational system, the 2007 recession and the proceeding economic recovery have compelled states to focus on improving the educational system's efficiency in the United States. The current culture of each individual educational sector and businesses working entirely within their own boundaries fails to meet the current and future economic needs of America ("Preparing

Every Citizen for the Knowledge Economy," 2012). While numerous states have implemented

P-20 councils or policies, states need to define the end goal in relation to business and industry

workforce needs in the current global economy, and then backward design the college to

workforce knowledge and skills and the pK-12 to college knowledge and skills that each citizen

should possess to ensure they are successful in the current knowledge economy.

In a 2011, the McKinsey Center for Government study found that colleges and

universities in the United States appear to misidentify the preparedness of their graduates to

function in America's workforce in the global economy (Manyika et al., 2011). Survey data

from the McKinsey Center for Government study found that seventy-two percent of colleges and

universities identified their college graduates were ready for the American workforce; however,

only forty-two percent of the surveyed employers in the study found their recent hires of college

graduates were ready to meet the workforce needs (Manyika et. al, 2011). This suggests that for

America to implement a P-20 educational continuum that feeds America's workforce needs in

the global economy there needs to be additional "competent labor market research and an

understanding of the skills employers are looking for" (Dorrer, 2016, p. 2) in college graduates.

When the labor market research on skills needed by employees is determined, then the P-20

continuum can focus on the coordination and action that is needed at the state and local levels to

ensure that America's educational system provides the workforce that is needed for the United

States to compete in the global economy.

Teaching 21st Century Skills. The emphasis on '21st century skills' or competencies

instead of specific content knowledge was first made by economist and frequently began to

appear in research in the 1990s (Breslow, 2015). Globally, economist made the argument that

the traditional jobs that were a mainstay of the middle class citizens were disappearing, which

created an urgency for current students to develop the skills and knowledge they need for success in the global economy (Breslow, 2015; Rosefsky Saavedra & Opfer, 2012). In *The Pedagogy and Pleasures of Teaching a 21ˢᵗ–Century Skill*, Lori Breslow (2015) suggested that the focus of teaching 21ˢᵗ century skills to students began in the United States. In 2002, a collaborative partnership between the United States Department of Education, corporations (such as Apple, Dell, Cisco, and Microsoft), non-profits, and other government agencies called *The Partnership for 21ˢᵗ Century Learning* was created to address the urgent need for a capable workforce in the global economy (Breslow, 2015). Specifically, a workforce that needed fewer employees with basic skills and more employees with complex thinking and communication skills (Levy & Murnane, 2004, 2013).

With the transition to a global economy, economists strongly urged that the United States education system from kindergarten through college change to teach students the skills and competencies they needed to work with "ideas, people, and/or systems rather than physical objects" (Breslow, 2015, p. 421). The economist argued that with the interconnectedness of the economy required schools to teach students to communicate, collaborate and problem solve with people all over the globe (Rosefsky Saavedra & Opfer, 2012). In 2008, Tony Wagner's book *The Global Achievement Gap* built on the idea of teaching 21ˢᵗ century skills and proposed that America's students needed the following skills to be successful in the global economy: critical thinking and problem solving; collaboration and leadership; agility and adaptability; initiative and entrepreneurialism; effective oral and written communication; accessing and analyzing information; and curiosity and imagination. Wagner identified these skills from several hundred interviews with leaders from business, nonprofits, and education.

In 2012, The Assessment and Teaching of 21st century Skills consortium in Melbourne, Australia produced a quadrant of categories that identified knowledge, skills, attitudes, values and workplace ethics that the traditional schools were not teaching in their curricula. The four categories were ways of thinking, tools for working, ways of working, and ways of living in the world ("ATC21S," 2017). At approximately the same time, the National Research Council of the United States National Academies published *Education for Life and Work: Developing Transferable Knowledge and Skill in the 21st Century* (2012) which proved to be an important contribution to the discussion on the importance of 21st century skills in the United States (Breslow, 2015). *Education for Life and Work: Developing Transferable Knowledge and Skill in the 21st Century* grouped 21st century skills into three different categories: cognitive, intrapersonal, and interpersonal (Pellegrino & Hilton, 2012). In the book, James Pellegrino and Margaret Hilton concluded, "cognitive competencies have been more extensively studied than interpersonal and intrapersonal competences" (p. 4).

Teaching 21st century skills focus on teaching communication skills, critical or higher order thinking, and life-long learning. American students are not learning these 21st century skills, regardless of their categorization, when compared to other industrialized nations on the PIAAC assessment for literacy, numeracy, and problem solving. Furthermore, the adults of the United States, rank in the bottom half on the PIAAC assessments compared to other adults in participating nations (OECD, 2013). The lackluster performance on America's students is contributed to the "outdated, transmission model of education, through which teachers transmit factual knowledge to students via lectures and textbooks" (Rosefsky Saavedra & Opfer, 2012, p. 8). With the transmission model of education predominate in the United States, students learn critical information, but they do not have much practice applying the knowledge to new contexts,

using it to solve problems, or communicating the new knowledge to others in complex ways (OCED, 2012; Rosefsky Saavedra & Opfer, 2012). Thus, the transformative model of education is not an effective way to teach 21st century skills.

With the traditional model of education not producing the workforce needed to compete in the global economy, the educational system must change to educate students differently than in the past (Deeper Learning Strategic Plan Summary: Education Program, 2012). The educational system must meet America's workforce demand. In the past few years, "the idea that K-12 education should focus on preparing students for college and careers has gained wide acceptance among educators and policymakers" (Frizzell, Braun, Ferguson, Stark, & Kobe, 2017, p. 1). However, there are still boundaries that exist between educators, policymakers, and the public on how to balance academic preparation with the educational experience that prepares students to build essential career skills and abilities (Frizzell, et. al, 2017). In the 2016 Phi Delta Kappan poll on the American public's attitudes toward public schools, only forty-five percent of those survey felt that preparing students academically is the main goal of public education ("Why School?," 2016). In addition, only one-third of the forty-five percent feel "strongly" that this is the main goal ("Why School?," 2016). In comparison, twenty-five percent felt that public schools main goal should be preparing students for work; and, twenty-six felt that public schools main goal should be preparing students to be good citizens ("Why School?," 2016).

With the purpose of public education in the United States and standards changing, "curriculum frameworks, instructional methods, and assessment strategies must change, also" (Rosefsky Saavedra & Opfer, 2012, p. 12). For curriculum framework, pK-12 public schools need to build upon the recent curriculum reform initiative of the Common Core State Standards (Bidwell, 2014). Adopted by almost every state in the United States, the CCSS were designed to

prepare students for postsecondary education and workforce success ("Common Core State Standards Adoption Map - Academic Benchmarks," 2016). The CCSS were internationally benchmarked against the standards of high performing nations around the world ("Common Core State Standards Adoption Map - Academic Benchmarks," 2016; & Deeper Learning Strategic Plan Summary: Education Program, 2012). In addition to being preparing students for postsecondary success and to the benchmarking against high performing nations in educational attainment, the CCSS "weave critical thinking and problem-solving with fluency and understating of essential principles" (Deeper Learning Strategic Plan Summary: Education Program, 2012, p. 9).

There also must be a change in pedagogy in traditional schools to teach 21st century skills. In *Learning 21st-Century Skills Requires 21st-Century Teaching*, Anna Rosefsky Saavedra and V. Darleen Opfer (2012) suggest "learning scientist have taught us…lessons relative to teaching 21st-century skills and how pedagogy can address [student learning] needs" (p. 9). The first lesson that Rosefsky Saavedra and Opfer suggest is that teachers must make the learning relevant to students by making the learning topic resonate with the students. By making learning relevant, students are able to understand how the specific learning outcome fits within the big picture of the subject (Rosefsky Saavedra & Opfer, 2012). In addition to relevance, learning should transcend subject area disciplines. Students should not only learn the knowledge associated with the subject, but rather the students should learn the knowledge and the "skills associated with the production of knowledge within the discipline" (Rosefsky Saavedra & Opfer, 2012, p. 10).

Teachers should focus on developing both lower-level and higher-order thinking skills in students. While research shows that lower level thinking exercises were common in former

versions of curricula, teachers should make the transition from breadth of knowledge for depths

of knowledge (Rosefsky Saavedra & Opfer, 2012). To develop higher order thinking skills,

teachers should require students to transfer their knowledge and skills in one discipline to other

disciplines or in other areas of the students' lives (Rosefsky Saavedra & Opfer, 2012).

The global economy will require lifelong learners who can adapt to the ever-changing

economic demands. Thus, teachers should focus on teaching students how to learn on their own.

To ensure students have the ability to learn on their own, students must be cognizant of how they

learn (Rosefsky Saavedra & Opfer, 2012). Finally, teachers need to design lessons that foster

creativity because "creativity is prized in the economic, civic, and global spheres" in the global

economy" (Rosefsky Saavedra & Opfer, 2012, p. 12).

In an effort to assess 21st century skills, pK-12 schools need to shift from multiple choice

assessments to assessments that include essay writing, problem solving, and performance events

(Deeper Learning Strategic Plan Summary: Education Program, 2012). These assessments

should include comprehensive, year-end summative assessments and daily diagnostic

assessments used within the classroom (Deeper Learning Strategic Plan Summary: Education

Program, 2012). Through a thorough analysis of both daily diagnostic assessments and year-end

summative assessments, teachers can use the information to influence curriculum adjustments

and administrators can use the information to improve teaching practices.

Conclusion

This literature review provided an overview of the emergence of the global economy, its

impact on the United States workforce or lack thereof, its impact on cities and communities in

the United States, and the changes needed to ensure pK-12 public schools create a highly skilled

workforce that meets the workforce demands in the United States. Both "globalization [and]

economic necessity…[have] compound the urgency for students to develop the skills and

knowledge they need for success" in today's economy (Rosefsky Saavedra & Opfer, 2012, p. 8).

The need for the majority of America's workforce to be creative and innovative has created a

dramatic shift in the United States and across the globe (Donner & Shockley, 2010; Schwab,

2015; Wagner, 2008). The 2007 report produced by the National Center on Education and the

Economy, *Tough Choices or Tough Times*, concluded that most Americans do not have the type

of education to create or innovative in the global economy.

The deficiency in workforce skills in America citizens as compared to other nations was

brought to light through the 2013 PIAAC assessment results for United States' adults from ages

sixteen to sixty-five. In the 2013 PIAAC assessments that measured the nation's skills in three

domains of literacy, numeracy, and problem solving in technology, American adults scored in

the bottom half as compared to the other participating nations (OCED, 2013). Adding to this

concern was the United States' Millennials performance on the 2012 PIAAC assessments. In the

2012 PIAAC assessments, millennials scored in the bottom five countries in literacy, and the

millennials scored last in the numeracy and problem solving in technology (Goodman et. al,

2015).

A 2016 study by Georgetown University Center on Education and the Workforce analysis

of Current Population Survey, displays the vast difference in the current job market for

Americans who have at least some college education compared to the job market for Americans

who have a high school diploma or less (Carnevale et. al, 2016). From 2010 to 2016, the United

States economy added 11.6 million jobs with ninety-nine percent of the new jobs went to

employees with at least some college education (Carnevale et. al, 2016). The shift to needing

some college or a college degree to obtain employment in the United States is attributed to the

global economy's demand for a workforce that is innovative and possesses the skills and knowledge required of the global economy (Carnevale et. al, 2016; Donner & Shockley, 2010; Levy & Murnane, 2013, 2014; Uhalde & Strohl, 2006).

With the globalization of the world's economy, a massive shift in spatial geography has affected America's cities and communities through the rise of innovation districts across the United States by altering the location preference of America's highly educated workers (Katz & Wagner, 2014). The recent trend is for innovative districts to leave the isolates suburban areas and cluster together in downtowns of major United States cities. By clustering in major cities in the U.S., innovative districts have attracted America's most talented workers to these specific areas, which has increased economic growth since the 2007 recession through the creation of new jobs (Cortright, 2014). Recent trend data from 2014 shows that young college graduates between the ages of 25 to 35 have increased by thirty-seven percent since 2010 in the 51 major metropolis areas in the United States (Cortright, 2014). This migration of young talented workers to major metropolis areas in the U.S. has increased stress on small towns and rural communities when competing for workforce talent (Sassen, 1996).

To address America's workforce needs and for America to stay competitive in the global economy, President Barack Obama called for educators, public officials, and policymakers to ensure every student in America graduates from high school with the necessary skills to prepare them for college and a successful career in the global economy (U.S. Department of Education, 2012b). In addition, President Obama's administration outlined a plan to improve America's career and technical education through strong collaboration between secondary education, postsecondary education, and industry partners to ensure an effective implementation of the

career and technical graduates directly into America's workforce (U.S. Department of Education, 2012a; U.S. Department of Education, 2012b).

Thus, the revamping of United States' mass educational system is necessary through the successful collaboration between pK-12 education, postsecondary education, and industry partnerships creates a P-20 pipeline. *The American Diploma Project* defines the P-20 goal as one that drives all students towards either college or career readiness, which will ensure that students have the necessary education to ensure they are ready for the global economy (Cohen, 2008). Regardless, the alignment of America's mass education system to produce academic knowledge outcomes does not prove to be enough to create the workforce demands of the global economy.

In "addition to being academically prepared, students need opportunities to develop important skills and competencies" (Frizzell, et. al, 2017, p. 14). Burrus et. al (2013) identified a skills gap between recent college graduates and 21st century workforce needs. Through their analysis of the U.S. Department of Labor's O*NET job database, Burrus et. al (2013) concluded that the five most critical skills for workers in the United States to compete in the global economy are problem solving, fluid intelligence, teamwork, innovation, and communication skills. To teach students, the future of America's workforce, the broad range of content knowledge and skills needed in the global economy, America's educational systems must adjust curriculum frameworks, instructional strategies, and assessment methods to ensure students transition into college and the workforce (Rosefsky Saavedra & Opfer, 2012).

CHAPTER III: METHODOLOGY

The research study used a mixed methods design, which is a process for collecting and analyzing both qualitative and quantitative data during stages of this single research project (Caruth, 2013). The researcher chose the mixed methods study to understand the complex issue of the study more clearly by collecting both closed-ended data from the quantitative research phase and open-ended data from the qualitative research phase. For both sets of data, the researcher then interpreted the two different data sets independently. The independent quantitative interpretations and qualitative interpretations were combined into a single data set using a convergent design method commonly used in mixed method studies. By using the convergent design to merge the two data sets, the researcher then drew interpretations based on the combined strengths of both sets of data to understand the research problem in greater depth (Creswell, 2015). Thus, using the mixed methods research design the researcher combined statistical trends from the quantitative research and both personal experiences and stories from the qualitative research which provided "a better understanding of the research problem than either form of data alone" (Creswell, 2015, p. 2).

In the quantitative design portion of the research study, the researcher collected data that research indicated as key variables to facilitate answers to the study's research questions. The variables were statistically analyzed to provide information that was interpreted by the researcher. The interpretation of the statistical analysis were then applied to the research questions to determine if the information gained from the quantitative research either validated or invalidated the research questions (Creswell, 2015).

For the qualitative portion of the research study, the researcher posed general open-ended questions to the identified subjects in interviews and recorded the conversations. The

conversations were then turned into text. After turning the interviews into text, the researcher

conducted a thematic analysis of the texts. The thematic analyses were then interpreted by the

researcher to determine if the qualitative research validated the research questions (Creswell,

2015).

The quantitative and qualitative portions of the research study followed the same process:

the problem was identified; data was collected; the data was analyzed; and the results were

interpreted. Upon interpreting the quantitative data and then interpreting the qualitative data, the

researcher compared the interpretation from both phases using the mixed methods convergent

design process. Thus, using a mixed methods approach allowed the researcher to use the

strengths of both the quantitative and qualitative approaches by obtaining two different

perspectives in regards to the research questions: close-ended quantitative data and open-ended

qualitative data. By using the mixed methods approach, the researcher gained a more

comprehensive view of the data than the researcher would have obtained by only using either the

quantitative or qualitative research design for the study (Croswell, 2015).

Purpose of the Study

With the emergence of the global economy, America's future economic success depends

on producing a workforce with the essential competencies to function in an innovative economy;

thus, the strength of the United States' economy is directly related to the strength of America's

public education system (U.S. Department of Education, 2012b). Kentucky's leaders have

recognized the significance of the correlation of economic strength and advanced education

attainment for all of its students ("Honeycutt Spears, 2014; "Kentucky Rising Fact Sheet," 2015).

The economic leaders of Paducah, Kentucky have recognized the need to increase the education

attainment of their adults to ensure the local workforce needs are met (Avalanche Consulting,

Inc., 2016). The national, statewide, and local demand for a highly educated workforce that will

meet both business and industry needs has led to the creation of different forms of P-20 councils

across America that have little to no empirical evidence of their success (Rippner, 2014). With

Paducah, Kentucky experiencing a declining population for decades ("Population of Paducah,"

2016; U.S. Census Bureau, 2016) and the worst economic growth of any region in Kentucky

(Coomes and Kornstein, 2010), the research study used a convergent designed mixed methods

research approach to analyze both quantitative data and qualitative data in the Paducah,

Kentucky region and then merge the interpretations together to draw a more comprehensive view

of the problem in an effort to address the workforce gaps in the community and region.

Research Questions

For this mixed methods study, the researcher's hypothesis is that within the Paducah

micropolitan area, there is a significant difference between current workforce skill levels and

employer expectations. To investigate this hypothesis, the researcher will explore the following

research questions:

1) What actions should secondary schools in the Paducah micropolitan area take to supply
   the local workforce needs?

2) What are the performance indicators needed by high school graduates in the Paducah
   micropolitan area to successfully transition to college?

3) What are the essential skills needed to successfully transition into the Paducah
   micropolitan area's workforce?

4) Is there a statistically significant difference in the performance indicators needed for

successful transition to college for the Paducah micropolitan area compared to the state of

Kentucky?

5) What actions should pK-12 public schools implement to teach the essential skills needed

by the Paducah micropolitan businesses?

Setting

For the research study, the setting is the Paducah micropolitan area. The micropolitan

area was defined in 2004 by the U.S. Department of Commerce's Bureau of Economic Analysis

[BEA] which includes Ballard County, Livingston County, and McCracken County in Kentucky

and Massac County in southern Illinois ("New BEA Economic Areas for 2004," 2004). Since

the research study focuses on how to create a workforce that meets the economic area's

demands, the researcher analyzed the transitions from secondary to postsecondary institutions

and the transitions from postsecondary institutions into the workforce.

The quantitative portion of the research study expands to a larger area because the

Paducah micropolitan area serves as the economic hub for a larger geographical area due to the

relationship that exists between Paducah, Kentucky and the potential workforce participants who

are within commuting distance of the micropolitan economic center (Johnson, 1995). Thus, the

essential academic performance indicators of the high school to college transitions were analyzed

to include the additional workforce participants from the surrounding area. The additional

counties that surround the BEA Economic Area defined for Paducah, Kentucky include the

western Kentucky counties of Caldwell County, Calloway County, Carlisle County, Graves

County, Lyon County, and Marshall County. For all of the area, the pK-12 public school cohort

graduation rates were analyzed over the most current five-year set of data and compared to the

rest of Kentucky. All of the geographical area that the Paducah micropolitan draws workforce from was analyzed for college and career readiness rates for the most current five-year period and compared to the same time frame for the rest of Kentucky. However, the graduation rate data and college and career readiness data for Massac County, Illinois was excluded from the quantitative research portion of the study due to Illinois and Kentucky state boards of education not defining high school graduation rate calculations similarly nor college readiness benchmarks similarly ("College Readiness Indicators," 2016; "Illinois Report Card," 2016).

Participants

The participants for the study were from various populations. For the quantitative analysis for the transition to college metrics defined in the literature, the pK-12 public schools' cohort graduation rates that have the potential to meet the workforce needs of the Paducah micropolitan area were analyzed for the school years of 2013 through 2016 excluding Massac County Unit School District No. 1. Similarly, pK-12 public schools' college and career readiness rates for the cohort of graduates spanning the 2013 through 2016 school years were analyzed excluding Massac County Unit School District No. 1. The pK-12 public schools that are encompassed in the workforce area for Paducah, Kentucky are the following Kentucky public school districts: Ballard County Public Schools, Caldwell County Public Schools, Calloway County Public Schools, Carlisle County Public Schools, Graves County Public Schools, Livingston County Public Schools, Lyon County Public Schools, Marshall County Public Schools, Mayfield Independent Schools, McCracken County Public Schools, Murray Independent Schools and Paducah Independent Schools. Similarly, Massac County Unit School District No. 1 in Illinois graduate rate analysis for the years 2013 through 2016 was excluded for the Paducah micropolitan workforce area.

For the participants for the qualitative portion of the study, the Paducah micropolitan population of employers was considered. Lists of the largest employers were obtained from the Paducah Area Chamber of Commerce and the Paducah Economic Development office (Rikel, 2017; Wilson, 2017). For the qualitative interviews to analyze the transitions for college graduates who are entering the workforce, purposeful sampling was used to determine four of the largest employers. Careful consideration was used to select one employer from three of the top five business clusters (health, professional services, and river industries) for the Paducah micropolitan area as defined by the Paducah Economic Development strategic plan ("Forward Paducah: Economic Development Strategy for Greater Paducah," 2016). In addition, the researcher interviewed eight of the twelve pK-12 public school instructional supervisors within the Paducah micropolitan area. For pK-12 public school districts, the instructional supervisor is responsible for districtwide implementation and monitoring of curriculum, instruction, and assessment.

Sample Selection

The researcher sought the approval of the Murray State University's Institutional Review Board [IRB]. Once the IRB granted permission to conduct the study, the researcher conducted a quantitative study of the secondary schools in the region and compared the metrics to the other secondary schools in Kentucky. The Paducah micropolitan area consists of the public pK-12 schools in three western Kentucky counties (Ballard County, Livingston County, and McCracken County) and one public pK-12 school in Illinois (Massac County) as defined by BEA ("New BEA Economic Areas for 2004," 2004). The Paducah micropolitan area is defined by BEA as an "economic node – metropolitan areas or similar areas that serve as centers of economic activity" (Johnson, 1995, p. 75) that BEA reestablished in 2004 ("New BEA Economic Areas for 2004,"

2004). The Paducah micropolitan area extends beyond the four counties due to the economic

relationship that exists between the Paducah micropolitan area and its commuting partners that

contribute to Paducah's workforce (Johnson, 1995). The additional workforce participants are

made up of the surrounding counties in Kentucky (Caldwell County, Calloway County, Carlisle

County, Graves County, Lyon County, and Marshall County) that are included in the pK-12

public schools' metrics in the quantitative analysis.

For the qualitative study, the researcher randomly selected four of the largest employers

in the Paducah micropolitan area as recognized by the Paducah Economic Development agency

and the Paducah Area Chamber of Commerce (Rikel, 2017; Wilson, 2017). *Forward Paducah:*

Economic Development Strategy for Great Paducah identifies five different business clusters

(advanced manufacturing; creative industries; health; professional services; and the river

industry) where there is a focus on targeting the areas resources with the goal of accelerating the

workforce development for the micropolitan area ("Forward Paducah: Economic Development

Strategy for Greater Paducah," 2016). Purposeful sampling was used to select one of the largest

employers from three of the five target business clusters as defined by the Paducah Economic

Development strategic plan. To ensure the companies that were selected provided rich

information with respect to improving the competencies of employees within the region, the

interviews were with senior level executives from each company that were directly involved with

hiring and recruiting employees for the companies.

For the pK-12 public schools instructional supervisors, the author numbered the

instructional supervisors in alphabetical order by their district name. Using a random number

generator, the first interviewee was selected randomly. After the initial interview with the first

instructional supervisor, a snowballing sampling technique was used to allow the first

interviewee to suggest the next interviewee. The snowballing sampling technique was used until

eight of the possible twelve instructional supervisors were interviewed, and the researcher

determined that the data had become saturated.

Research Design

The American Diploma Project (2011) outlines both the cohort graduation rate and the

cohort college and career readiness rate as key performance indicators for college readiness for

pK-12 schools. The cohort graduation rate is a U.S. Department of Education calculation that is

defined as the percentage of 9th graders who graduate high school in four years that is adjusted

for students who transfer out of the high school during their high school career. Likewise, the

cohort college and career readiness rate that identifies the percentage of students who score at the

state defined college or career-ready benchmarks established by the state. For the quantitative

analysis, the researcher compared the average five-year cohort graduation rates and college and

career readiness rates for the pK-12 public schools in the defined economic area from 2013 to

2016 against the other pK-12 schools' cohort graduation rates and college and career readiness

rates in Kentucky over the same time period. In addition, the researched compared the change in

both the cohort graduation rates and the college and career readiness rates of the Paducah

micropolitan area pK-12 public schools with the rest of the pK-12 public schools in Kentucky by

calculating the change from 2013 to 2016 for all of the pK-12 public schools.

In this study, the researcher used Kentucky's Council of Postsecondary Education's

established college readiness benchmarks to determine the percentage of graduates who are

college-ready. All public postsecondary institutions in Kentucky use the ACT subject area test

scores of 18 or higher in English, 20 or higher in reading, and 19 or higher in mathematics to

transition beginning college students into college credit bearing coursework instead of taking

developmental, supplemental, or transitional coursework that do not lead toward college degree requirements ("College Readiness Indicators," 2016). In addition to the ACT benchmarks, Kentucky also allows students to meet minimum benchmarks on the COMPASS and KYOTE electronic assessments that allow colleges to evaluate students' skills in English, reading, and mathematics and are used by colleges to place students in the appropriate college classes ("Kentucky Department of Education: Compass," 2017; "Kentucky Department of Education: KYOTE," 2017).

Career readiness is defined as the linking of knowledge and skills that students learn in coursework through the Career and Technical Education system in Kentucky. Students in Kentucky must take at least a three course sequence in a Kentucky recognized Career and Technical Education pathway. To be recognized as career-ready, students must reach the benchmarks on the WorkKeys or Armed Services Vocational Aptitude Battery [ASVAB] assessment for academic readiness, and the students must pass a Kentucky Occupational Skills Standards Assessment [KOSSA] exam or obtain a state recognized industry certification ("Kentucky Department of Education: Career and Technical Education Resources," 2016).

In the quantitative analysis of the secondary school transition to college, the college and career readiness rates from 2013 to 2016 of Massac County, Illinois will be excluded from the study. The exclusion is due to the Illinois state definition of college readiness not being identical to the Kentucky definition of college readiness. The state of Illinois defines college readiness as a student who has achieved a composite score of at least a 21 on the ACT ("Illinois Report Card," 2016). This exclusion protected the validity and reliability of the quantitative research study design.

The Educational Testing System's report *Identifying the Most Important 21ˢᵗ Century Workforce Competencies: An Analysis of the Occupational Informational Network* [O*NET] sought to identify the most important workforce competencies for employees to succeed in today's economy. The O*NET database was developed and maintained by the U.S. Department of Labor and contains an "extensive job analysis containing data on 974 occupations" (Burrus, Jackson, Xi, & Steinberg, 2013, p. 5). In the analysis, the researchers analyzed the importance of 52 abilities, 16 ratings on work styles, 35 ratings on workforce skills, and 33 ratings on knowledge that employers contribute to a worker's success in their occupation. The data was split into two sets, and the researchers performed a principal component analysis of each data set. This analysis provided 15 different capacities which were ranked against three different 21ˢᵗ century skills frameworks. The analysis suggested that the following five competencies were considered were significant in today's economy (problem solving; fluid intelligence; achievement/innovation; teamwork; and, communication skills). Finally, these five competencies were correlated with salaries and four of the five competencies were positively and significantly correlated with wages in the United States (Burrus et. al, 2013).

The O*NET study identified competencies that are important in America's workforce to be successful in today's economy; however, the study did not analyze the extent of which today's workforce possesses these competencies. In the conclusion of the study, the researchers suggested that determining the extent in which today's workforce possess these significant five competencies was "clearly an area ripe for future research" (Burrus et. al, 2013, p. 30). Therefore, in the qualitative phase of this study the author sought to quantify the extent that these five competencies are prevalent in Paducah's micropolitan workforce.

In analyzing the transition from secondary or postsecondary education into the Paducah workforce, the researcher used a qualitative approach to analyze the workforce capacities that exist and that are absent within the current workforce in the economic region. The Paducah Economic Development strategic plan identifies five different business clusters in the economic region. Using purposeful sampling to identify one of the largest employers in three of the business cluster, the researcher selected the health cluster, the professional services cluster, and the river industry cluster to sample.

The researcher emailed an official invitation and consent form to a senior level executive at each of the four companies that were selected and agreed to participate in the interview. The researcher and participant determined a time and location to conduct the interview. The interview questions were derived from the researcher's analysis of the *Identifying the Most Important 21st Century Workforce Competencies: An Analysis of the Occupational Informational Network* study. The researcher asked a series of open-ended questions investigating the competencies that the participant seeks in prospective employees and identifies as lacking in recent hiring of employees. The researcher determined that the data was saturated after four interviews with senior level executives of four of the largest employers in the Paducah micropolitan area. The series of questions the researcher asked are as follows:

1) What are the essential skills your company seeks from prospective employees?

2) For these specific skills, how does your company screen for these skills in the interview process?

3) Explain the different approaches that your company uses to attract talented applicants with the skills you are looking for in an employee.

4) What university/college and degree/certification does your company have the most

success from in attracting and hiring talented workers with the competencies or skills you

are looking for?

5) How would you rank the following skills in importance for your company or career field:

1) problem solving; 2) fluid intelligence (using logic or finding patterns); 3)

innovation/achievement 4) teamwork; and 5) communication skills?

6) What are the biggest gaps in terms of skills that your company sees in new employees?

7) Explain how your company teaches these essential skills that your company finds are

missing to your new employees.

8) How has your company worked with pK-12 school systems to solve the issues of the

missing skills or competencies that you experience are missing in your new employees?

9) How has your company worked with postsecondary partners to solve the issues of

missing skills or competencies that you experience as missing in new employees?

10) How would you recommend from your company's/organization's perspective that

secondary schools and postsecondary schools help develop these skills that you have

identified?

For the pK-12 public schools instructional supervisors, the author numbered the

instructional supervisors in alphabetical order by their district name. Using a random number

generator, the first interviewee was selected randomly. The researcher emailed an official

invitation and consent form to instructional supervisor that was selected and agreed to

participate in the interview. The researcher and participant determined a time and location to

conduct the interview. The interview questions were derived from the researcher's analysis

of the *The American Diploma Project* and *Identifying the Most Important 21st Century*

Workforce Competencies: An Analysis of the Occupational Informational Network study. The researcher asked a series of open-ended questions investigating the academic indicators and workforce competencies that the pK-12 public school district is focused on for students who are enrolled in their perspective school districts. After the initial interview with the first instructional supervisor, a snowballing sampling technique was used to allow the first interviewee to suggest the next interviewee. The snowballing sampling technique was used until eight of the possible twelve instructional supervisors were interviewed, and the researcher determined that the data had become saturated. The series of questions the researcher asked are as follows:

1) What are the performance indicators that your school district measures for its academic success?

2) What does your district identify as the essential skill set for employment in the global economy?

3) How does your school district prepare students for the workforce that is required by the global economy?

4) In what ways does your district collaborate with local business/industry to better meet their workforce needs?

5) How does your district measure key workforce skills outside of academic knowledge in reading, writing, and mathematics?

6) What process has your district used to determine workforce needs of your business community?

7) In what ways has your district realigned curriculum to meet the needs of your business community?

8) Share with me initiatives that your district has undergone to better prepare students for college? The workforce?

9) In what ways has your district adjusted instructional strategies to better prepare students for college? The workforce?

10) What would you suggest that businesses/industry do to better help pK-12 students prepare for the global economy? College students?

11) How would you rank the following skills in importance for your company or career field: 1) problem solving; 2) fluid intelligence (using logic or finding patterns); 3) innovation/achievement 4) teamwork; and 5) communication skills?

Data Collection

After receiving permission from Murray State University's IRB, the researcher started collecting the quantitative data. The five-year cohort graduation rates from 2013 through 2016 for the Kentucky pK-12 public schools were collected from the Kentucky Department of Education. The college and career readiness rates were collected from the Kentucky Department of Education for the 2013 through 2016 school years for each of the public pK-12 districts in Kentucky. The statistical analysis chosen by the researcher for the five-year cohort graduation rates and college and career readiness rates can be found in the data section of the study.

The researcher conducted the interviews of four senior level executives responsible for hiring and developing employees for their companies. During the interview, the researcher took field notes and recorded the interview for accuracy of the responses from the interviewees. The interview was transcribed verbatim. A copy of the interview and field notes were emailed to the interviewees to check for accuracy. Once the transcripts were checked for accuracy by the interviewee, the transcripts were coded to start the data design of the conceptual framework

which sets the foundation for the themes of the qualitative portion of the study. The process that the researcher used to code the interviews can be found in the data section of the study.

The researcher conducted the interviews of eight public pK-12 school instructional supervisors responsible for district-wide curriculum and assessment for their school districts. During the interview, the researcher took field notes and recorded the interview for accuracy of the responses from the interviewees. The interview was transcribed verbatim. A copy of the interview and field notes were emailed to the interviewees to check for accuracy. Once the transcripts were checked for accuracy by the interviewee, the transcripts were coded to start the data design of the conceptual framework which sets the foundation for the themes of the qualitative portion of the study. The process that the researcher used to code the interviews can be found in the data section of the study.

Data Analysis

During the data collection phase of the study, the quantitative data collected and the qualitative data collected from the interviews were stored on a password protected laptop. For the quantitative data sets obtained from the Kentucky Department of Education, the study design required the researcher to measure both of the dependent variables, college and career readiness and five-year cohort graduation rates, in two independent groups, the public school districts that make up the Paducah micropolitan area and the rest of the public school districts in Kentucky. The qualitative data was gather through interviews with pK-12 public school instructional supervisors in the Paducah micropolitan area and through presidents or human resource directors of some of the largest employers of the Paducah micropolitan area.

Quantitative Data. Using an independent-samples t-test to determine if a significant difference exists in the mean graduation rates and average college and career readiness rates, the researcher

conducted an analysis of the Paducah micropolitan area compared to the state of Kentucky's

mean for both the five-year cohort graduation rate and college and career rate for the four year

period from 2013 to 2016. An independent-sample t-test was chosen by the researcher because

the test is used to investigate if there is a mean difference between the two independent groups

on a continuous dependent variable ("SPSS Statistics Tutorials and Statistical Guides: Laerd

Statistics," 2017).

For an independent-samples t-test, there are six different assumptions that have to be met

within the data set. The first assumption is that the data set has one dependent variable that is

measured at a continuous level. The second assumption that has to be met with the data set is

that the one independent variable of the data set has to have two categorical, independent

variables. The third assumption is that for the data set should have independence of observations

("SPSS Statistics Tutorials and Statistical Guides: Laerd Statistics," 2017).

For each data set of five-year cohort graduation rate and college and college readiness

data set, an independent-samples t-test analysis was done for the years of 2013, 2014, 2015, and

2016 for a total of eight different independent-samples t-tests. In addition, the difference in the

four-year change from 2013 to 2016 for both the college and career readiness means were

calculated by subtracting the 2013 means from the 2016 means for both college and career

readiness and cohort graduation rates. To make this calculation, the researcher had to remove an

independent public school pK-12 district (#132 in 2013 college and career readiness and five-

year cohort graduation means data sets) from the 2013 data set because it consolidated with the

county school system in which it resided starting with the 2013-14 school year. These two

additional data sets represent the change in both college and career readiness and the five-year

cohort graduation rates. The addition data sets that represented the four-year change from 2013

to 2016 for each school district were also analyzed using an independent-samples t-test because these data sets met the first three assumptions for the independent-samples t-test analysis.

The final three assumptions for the independent-sample t-test relate to the nature of the data sets being analyzed ("SPSS Statistics Tutorials and Statistical Guides: Laerd Statistics," 2017). The researcher used the IBM SPSS predictive analysis software to analyze the ten different data sets (2013, 2014, 2015, and 2016 college and career readiness means for the two independent groups; 2013, 2014, 2015, and 2016 five-year cohort graduation means for the two independent groups; the four-year change in college and career readiness means from 2013 to 2016 of the two independent groups; and, the four-year change in five-year cohort graduation means for the two independent groups).

The fourth assumption that has to be met for the independent-samples t-test is that there should be no significant outliers in the two groups of the independent variables in terms of the dependent variable (Fields, 2013). For each of the ten data sets that were analyzed by the IBM SPSS Statistics software in this study, box and whisker plots were created to identify any outliers for each specific data set. All ten different data sets contained outliers using the box and whisker plots analysis. Thus, each data set had individual means where their value was extremely too large or small in comparison to the other means of the data sets. These outliers can have a large negative effect on the results because they can exert a significant influence on the mean and standard deviation of the group ("SPSS Statistics Tutorials and Statistical Guides: Laerd Statistics," 2017). The researcher made the decision to leave all of the outliers in the data sets and conduct the next statistical analysis for the data sets at this point of the study.

The fifth assumption that has to be met for the independent-samples t-test is that the dependent variable should be approximately normally distributed for each group of the

independent variable (Fields, 2013). For each of the ten data sets analyzed by the IBM SPSS

Statistics software in this study, the researcher conducted multiple analyses to test for normality

of each data set. The researcher investigated both the skewness and kurtosis values of each of

the ten sets, and in addition, conducted the Kolmogorov-Smirnov test for each of the ten data sets

to test for normality. The Kolmogorov-Smirnov test identifies if the distribution of scores is

significantly different than a normal distribution by comparing "the two sets of scores to a

normal distributed set of scores with the same mean and standard deviation" (Fields, 2013, p.

185). The Test of Normality showed approximate normal distribution using the Kolmogorov-

Smirnov test (p > .05) for five of the data sets (2013 college and career readiness means; 213

five-year cohort graduation rates; 2014 college and career readiness means; 2016 college and

career readiness means; and, the four-year change in college and career readiness). The Test of

Normality did not show approximate normal distribution using the Kolmogorov-Smirnov test (p

< .05) for five of the data sets (2014 five-year cohort graduation means; 2015 college and career

readiness means; 2015 five-year cohort graduation means; 2016 five-year cohort graduation

means; and the four-year change in five-year cohort graduation means).

     For the five data sets that did not show normal distribution using the Kolmogorov-

Smirnov test (p < .05), the researcher made the decisions to remove all the outliers from each of

the data sets (2014 five-year cohort graduation means; 2015 college and career readiness means;

2015 five-year cohort graduation means; 2016 five-year cohort graduation means and four-year

change in five-year cohort graduation means). The Kolmogorov-Smirnov test was recalculated

on the five data sets again after the identified outliers were omitted from the data sets.

     Two of the data sets where outliers were removed (2015 college and career readiness

means and four-year change in five-year cohort graduation means) showed normal distribution (p

> .05) which meets the assumption of normality for an independent-sample t-test analysis. For

the remaining three data sets where the outliers were removed, the researcher compared the

skewness of the two different distributions within the four sets (2014 five-year cohort graduation

means; 2015 college and career readiness means; and 2016 five-year cohort graduation means).

Analysis of the skewness of the two different distributions within the three data sets showed that

the skewness of each distribution within each set were approximately similar (skewness between

the distribution sets less than .3). Therefore, the researcher determined that these three data sets

meet the assumption of normality for an independent-samples t-test because the results will not

be significantly affected using the data sets where the outliers were removed due to the similar

skewness within each distribution within each set.

The sixth assumption for an independent-sample t-test is that there is a homogeneity of

variance for the data within the set (Fields, 2013). Using the IBM SPSS Statistics software

program to carry out an independent-samples t-test for each of the ten data sets, the researcher

was able to use Levene's test for equality of variances to test for homogeneity of variances for

each set ("SPSS Statistics Tutorials and Statistical Guides: Laerd Statistics," 2017). After

running the independent-samples t-test for each of the ten data sets, the researcher found that the

assumption of homogeneity of variance was met (p > .05) for nine of the ten data sets using

Levene's Test for Equality of Variance. The one data set where homogeneity of variance was

violated was the 2016 5-year cohort graduation means.

For the nine data sets that met the assumption of homogeneity of variance, the researcher

interpreted the standard independent-samples t-test output from the IBM SPSS statistics

calculations for the significance between the data sets which are included in Chapter 4. For the

lone data set where the homogeneity of variances was violated, the researcher used the IBM

STSS statistics calculations referred to as the unequal variances t-test or Welch t-test ("SPSS

Statistics Tutorials and Statistical Guides: Laerd Statistics," 2017). The significance between the

data sets within the transformed 2016 five-year cohort graduation means is included in Chapter

4.

Qualitative Data. Maxwell (2013) found that qualitative research involves a continuous

interplay between data collection and data analysis through the interview process. Therefore, the

researcher began to analyze the data after the first interview to begin identifying patterns and

themes. Research suggest that there is not an explicitly defined way to accomplish qualitative

research because the analysis involves the researcher's process of making meaning (Denzin &

Lincoln, 2003; Maxwell, 2013).

The interviews with each instructional supervisor and presidents or human resource

director were structured person to person conversations. A formal structured approach was

chosen to "ensure the comparability of data across individuals…[which] are particularly useful in

answering questions that deal with *differences* between people and settings" (Maxwell, 2013, p.

88). The researcher audio recorded each interview and took notes during the interviews. The

audio recordings of the interviews were transcribed verbatim. The notes taken by the researcher

included anything that the researcher heard or was otherwise communicated to the researcher

during the interview (Maxwell, 2013).

The formal interviews were scheduled through an employer recruitment email (Appendix

A) and through a supervisor of instruction recruitment email (Appendix B). In each of the

twelve interviews, the sequence of events was similar. Rapport building with the interviewee

was followed by a review of Research Participation Consent form (Appendix C) and a reminder

that the interview was being recorded and then conducting the interview.

After each interview, the researcher listened to the audio recording and took notes on major themes from the interview. Then the interview was transcribed. After the transcription, the researcher emailed a transcribed version of the interview to the interviewee to check for accuracy. Throughout the interviews, the research continued to develop and refine tentative ideas about relationships that were emerging (Maxwell, 2013). After the qualitative data become saturated, the researcher used the online program dedoose.com to code the interviews to organize and cluster the main themes and categories.

Upon completion of the independent-samples t-test comparing the pK-12 public schools in the Paducah micropolitan area to the remaining pK-12 public schools remaining in Kentucky and the completing of the thematic review of the interviews with eight of the twelve pK-12 public school instructional supervisors and four interviews of presidents or human resource directors of four of the largest employers in the Paducah micropolitan area, the researcher used a convergent design method to merge the results of the quantitative data and qualitative data obtained in the study. The convergent design allowed the researcher to compare the results of the quantitative portion with the qualitative portion of the study. By using the convergent design model, the researcher was able to validate the trends and relationships of both the four-year college and career readiness rates and five-year cohort graduation rates with the major themes that emerged from the qualitative interviews (Creswell, 2013). Therefore, the researcher was able to gain "a more complete understanding than what would have been provided by each database alone" (Creswell, 2013, p. 36).

CHAPTER IV: RESULTS

Quantitative Findings and Analysis

The quantitative portion of this mixed methods study examined the college and career readiness rates and the cohort graduation rates of the pK-12 public school districts within the Paducah micropolitan area compared to the college and career readiness rates and the cohort graduation rates of the pK-12 public school districts in Kentucky. The Kentucky Department of Education provided data sets for the analysis of students who graduated from a pK-12 public school in Kentucky from 2013 through 2016. The study used an independent-samples t-test to analyze each of the individual data sets for both college and career readiness and cohort graduation rates for the school years 2013 through 2016. In addition, the study examined the change from 2013 to 2016 for each of the pK-12 school districts in Kentucky for both college and career readiness and graduation rates.

Background of the Sample

The population (N = 168) of the 2013 sample consisted of all the pK-12 public school districts in the state of Kentucky who had a college and career readiness and graduation rate calculated by the Kentucky Department of Education. The population (N = 167) of the 2014 through 2016 sample consisted of the pK-12 public school districts in the state of Kentucky who had a college and career readiness and graduation rate calculated by the Kentucky Department of Education. After the 2013 school year, one independent public school district consolidated with the county pK-12 public school district for financial reasons. For the analysis of the four-year change in college and career readiness rates and cohort graduation rates, the researcher removed the independent pK-12 school district's 2013 data that consolidated with the county school district from the 2013 data set giving the data set a population of 167 school districts.

Statistical Procedures

Data analyses were conducted using IBM SPSS Statistics software. For each school year data set, each individual school district was placed in alphabetical order and assigned a school identification number from 1 to 168 for the 2013 school year and from 1 to 167 for the 2014 through 2016 school years and the four-year change data sets that were calculated. Descriptive statistics were used to analyze the mean, median, standard deviation, skewness, and kurtosis for each of the ten data sets. The researcher conducted box and whisker plots for each of the ten data sets to identify any possible outliers that could negatively impact the normality of the data sets. Using IBM SPSS Statistics software, the researcher conducted the Kolmogorov-Smirnov test for each of the ten data sets to test for normality. For data sets where the Kolmogorov-Smirnov test for normality were violated ($p < 0.5$), the researcher chose to remove the outliers from the data set. IBM SPSS Statistics software again was used to conduct descriptive statistics to analyze the transformed data sets. The transformed data sets were analyzed using the Kolmogorov-Smirnov test for normality.

When the data sets meet the assumption of normality, the researcher conducted an Independent-samples t-test using IBM SPSS Statistics software on each data set to investigate if the data set met Levene's test ($p > .05$) for equality of variances. When the data set met Levene's test for equality of variances, the researcher analyzed the mean difference, standard error of the mean difference, the 95% confidence intervals, t-value, degrees of freedom, p-value, and effect size.

For the data set that violated Levene's test for equality of variances ($p < .05$), the researcher used the IBM STSS statistics calculations referred to as the unequal variances t-test or Welch t-test ("SPSS Statistics Tutorials and Statistical Guides: Laered Statistics," 2017). For the

data set that violated Levene's test for equality of variances, the researcher was able to use the

Welch t-test. The researcher used the Welch t-test output to analyze the mean difference,

standard error of the mean difference, the 95% confidence intervals, t-value, degrees of freedom,

p-value, and effect size.

Using the independent-samples t-test, the researcher was able to determine if a difference

existed between the college and career readiness and cohort graduation rates in the public pK-12

school districts in the Paducah micropolitan area and the remaining public pK-12 school districts

in Kentucky. By interpreting the results of the Independent-samples t-test, the researcher

determined if there was a statistically significant difference between the two independent groups

(Field, 2013).

2013 College and Career Readiness Rates. Table 2 provides a frequency analysis of

the 2013 College and Career Readiness Rates for the graduating seniors in the public pK-12

school districts in the Paducah micropolitan area (N = 12) and the remaining public pK-12

school districts (N = 157) in the state of Kentucky.

Table 2

2013 College and Career Readiness Rates Descriptive Statistics

	N	M	Mdn	SD	Skewness	Kurtosis
Paducah Micropolitan	12	62.16	60.80	9.60	.674	-.072
Rest of Kentucky	157	54.13	54.30	12.51	.029	.293

In analyzing the *2013 College and Career Readiness rates* of the pK-12 public schools in

the Paducah micropolitan (N = 12) area, the researcher determined the mean *2013 College and*

Career Readiness rates average to be 62.16 (SD = 9.60) as compared to the median score of

60.80. The distribution of *2013 college and career readiness rates* was positively skewed with a

negative kurtosis.

In analyzing the *2013 College and Career Readiness rates* of the remaining pK-12 public

schools (N = 157) in Kentucky, the researcher determined the mean *2013 College and Career*

Readiness Rates average to be 54.13 (SD = 12.51) as compared to the median score of 54.30.

The distribution of *2013 College and Career Readiness Rates* was positively skewed with a

positive kurtosis.

The researcher then used a box and whisker plot to analyze the *2013 College and Career*

Readiness Rates data set for outliers that could negatively impact the normality of the data set.

In analyzing the box and whisker plot, the researcher did not identify any outliers in the pK-12

public school districts in the Paducah micropolitan (N = 12) data set, and identified two outliers

(school district 11 and 143) in the remanding pK-12 public school districts (N = 157) in the state

of Kentucky.

The researcher investigated the *2013 College and Career Readiness Rates* data sets for

normality using the Kolmogorov-Smirnov test for normality for both data sets. The

Kolmogorov-Smirnov test (D(12) = .140, p= .200) suggested the distribution of 2013 college and

career readiness rates for the pK-12 public schools in the Paducah micropolitan area show

normality. The Kolmogorov-Smirnov test (D(157) = .056, p = .200) suggested the distribution

of *2013 College and Career Readiness Rates* for the pK-12 public schools in the remaining pK-

12 public school districts in the state of Kentucky show normality. Since the Kolmogorov-

Smirnov test suggested the data set had normality, the researcher chose to ignore the two outliers

(school district 11 and 143) in the data set.

An Independent-samples t-test was run using IBM SPSS to determine the if there was a

statistically significant difference between the means of the *2013 College and Career Readiness*

Rates in the public pK-12 school districts in the Paducah micropolitan area and the remaining

public pK-12 school districts in the state of Kentucky. The analysis showed there was a

homogeneity of variances for the *2013 College and Career Readiness Rates* for public pK-12

school districts in the Paducah micropolitan area compared to the remaining public pK-12 school

in Kentucky, as assessed by Levene's test for equality of variances (p = .282). Since the data set

met the assumption of homogeneity of variances, the Independent-sample t-test analysis was

interpreted. The researcher determined there was a statistically significant difference (p < .05)

in the *2013 College and Career Readiness Rates* between the pK-12 public schools in the

Paducah micropolitan area and the remaining pK-12 public schools in Kentucky, M = 8.02, 95%

CI [0.73, 15.33], t(167) = 2.172, p = .031, d = .651.

2013 Cohort Graduation Rates. Table 3 provides a frequency analysis of the 2013

Cohort Graduation Rates for the graduating seniors in the public pK-12 school districts in the

Paducah micropolitan area (N = 12) and the remaining public pK-12 school districts (N = 157) in

the state of Kentucky.

Table 3

2013 Cohort Graduation Rates Descriptive Statistics

	N	M	Mdn	SD	Skewness	Kurtosis
Paducah Micropolitan	12	92.03	92.15	3.94	-1.596	3.742
Rest of Kentucky	157	90.61	91.10	5.28	-.564	.032

In analyzing the *2013 Cohort Graduation Rates* of the pK-12 public schools in the

Paducah micropolitan (N = 12) area, the researcher determined the mean *2013 Cohort*

Graduation Rates average to be 92.03 (SD = 3.94) as compared to the median score of 92.03.

The distribution of *2013 Cohort Graduation Rates* was negatively skewed with a positive

kurtosis.

In analyzing the *2013 Cohort Graduation Rates* of the remaining pK-12 public schools

(N = 157) in Kentucky, the researcher determined the mean *2013 cohort graduation rates*

average to be 90.61 (SD = 5.28) as compared to the median score of 91.10. The distribution of

2013 cohort graduation rates was negatively skewed with a positive kurtosis.

The researcher then used a box and whisker plot to analyze the *2013 Cohort Graduation*

Rates data set for outliers that could negatively impact the normality of the data set. In analyzing

the box and whisker plot, the researcher identified one outlier (school district 132) in the pK-12

public school districts in the Paducah micropolitan (N = 12) data set, and identified three outliers

(school district 39, 84, and 158) in the remanding pK-12 public school districts (N = 157) in the

state of Kentucky.

The researcher investigated the *2013 Cohort Graduation Rates* data sets for normality

using the Kolmogorov-Smirnov test for normality for both data sets. The Kolmogorov-Smirnov

test (D(12) = .211, p = .145) suggested the distribution of *2013 Cohort Graduation Rates* for the

pK-12 public schools in the Paducah micropolitan area show normality. Since the Kolmogorov-

Smirnov test suggested the data set had normality, the researcher chose to ignore the three

outliers (school district 132) in the data set. The Kolmogorov-Smirnov test (D(157) = .068, p =

.075) suggested the distribution of *2013 Cohort Graduation Rates* for the pK-12 public schools

in the remaining pK-12 public school districts in the state of Kentucky show normality. Since

the Kolmogorov-Smirnov test suggested the data set had normality, the researcher chose to

ignore the three outliers (school district 39, 84, and 158) in the data set.

An Independent-samples t-test was run using IBM SPSS to determine the if there was a

statistically significant difference between the means of the *2013 Cohort Graduation Rates* in the

public pK-12 school districts in the Paducah micropolitan area and the remaining public pK-12

school districts in the state of Kentucky. The analysis showed there was a homogeneity of

variances for the *2013 Cohort Graduation Rates* for public pK-12 school districts in the Paducah

micropolitan area compared to the remaining public pK-12 school in Kentucky, as assessed by

Levene's test for equality of variances (p = .085). Since the data set met the assumption of

homogeneity of variances, the Independent-sample t-test analysis was interpreted. The

researcher determined there was not a statistically significant (p > .05) difference in *2013 Cohort*

Graduation Rates between the pK-12 public schools in the Paducah micropolitan area and the

remaining pK-12 public schools in Kentucky, M = 1.41, 95% CI [-1.66, 4.49], t(167) = .908, p =

.365, d = .271.

2014 College and Career Readiness Rates. Table 4 provides a frequency analysis of

the *2014 College and Career Readiness Rates* for the graduating seniors in the public pK-12

school districts in the Paducah micropolitan area (N = 12) and the remaining public pK-12

school districts (N = 156) in the state of Kentucky.

Table 4

2014 College and Career Readiness Rates Descriptive Statistics

	N	M	Mdn	SD	Skewness	Kurtosis
Paducah Micropolitan	12	67.53	68.35	9.00	.570	-.177
Rest of Kentucky	156	63.44	64.25	11.54	-.147	1.114

In analyzing the *2014 College and Career Readiness Rates* of the pK-12 public schools

in the Paducah micropolitan (N = 12) area, the researcher determined the mean *2014 College and*

Career Readiness Rates average to be 67.53 (SD = 9.00) as compared to the median score of

68.53. The distribution of *2014 College and Career Readiness Rates* was positively skewed with

a negative kurtosis.

In analyzing the *2014 College and Career Readiness Rates* of the remaining pK-12 public schools (N = 156) in Kentucky, the researcher determined the mean *2014 College and Career Readiness Rates* average to be 63.53 (SD = 11.54) as compared to the median score of 64.25. The distribution of *2014 College and Career Readiness Rates* was negatively skewed with a positive kurtosis.

The researcher then used a box and whisker plot to analyze the *2014 College and Career Readiness Rates* data set for outliers that could negatively impact the normality of the data set. In analyzing the box and whisker plot, the researcher did not identify any outliers in the pK-12 public school districts in the Paducah micropolitan (N = 12) data set, and identified five outliers (school district 11, 85, 125, 150, and 151) in the remanding pK-12 public school districts (N = 156) in the state of Kentucky.

The researcher investigated the *2014 College and Career Readiness Rates* data sets for normality using the Kolmogorov-Smirnov test for normality for both data sets. The Kolmogorov-Smirnov test (D(12) = .179, p = .200) suggested the distribution of *2014 College and Career Readiness Rates* for the pK-12 public schools in the Paducah micropolitan area show normality. The Kolmogorov-Smirnov test (D(156) = .059, p = .200) suggested the distribution of *2014 College and Career Readiness Rates* for the pK-12 public schools in the remaining pK-12 public school districts in the state of Kentucky show normality. Since the Kolmogorov-Smirnov test suggested the data set had normality, the researcher chose to ignore the five outliers (school district 11, 85, 125, 150, and 151) in the data set.

An Independent-samples t-test was run using IBM SPSS to determine the if there was a statistically significant difference between the means of the *2014 College and Career Readiness Rates* in the public pK-12 school districts in the Paducah micropolitan area and the remaining

public pK-12 school districts in the state of Kentucky. The analysis showed there was a

homogeneity of variances for the *2014 College and Career Readiness Rates* for public pK-12

school districts in the Paducah micropolitan area compared to the remaining public pK-12 school

in Kentucky, as assessed by Levene's test for equality of variances (p = .625). Since the data set

met the assumption of homogeneity of variances, the Independent-sample t-test analysis was

interpreted. The researcher determined there was not a statistically significant difference (p >

.05) in the *2014 college and career readiness rates* between the pK-12 public schools in the

Paducah micropolitan area and the remaining pK-12 public schools in Kentucky, M = 3.41, 95%

CI [-2.64, 10.83], t(166) = 1.200, p = .232, d = .359.

2014 Cohort Graduation Rates. Table 5 provides a frequency analysis of the *2014*

Cohort Graduation Rates for the graduating seniors in the public pK-12 school districts in the

Paducah micropolitan area (N = 12) and the remaining public pK-12 school districts (N = 156) in

the state of Kentucky.

Table 5

2014 Cohort Graduation Rates Descriptive Statistics

	N	M	Mdn	SD	Skewness	Kurtosis
Paducah Micropolitan	12	93.53	93.65	3.27	-.725	.208
Rest of Kentucky	156	92.26	93.00	4.67	-.597	.163

In analyzing the *2014 cohort graduation rates* of the pK-12 public schools in the Paducah

micropolitan (N = 12) area, the researcher determined the mean *2014 Cohort Graduation Rates*

average to be 95.53 (SD = 3.27) as compared to the median score of 93.65. The distribution of

2014 Cohort Graduation Rates was negatively skewed with a positive kurtosis.

In analyzing the *2014 Cohort Graduation Rates* of the remaining pK-12 public schools

(N = 156) in Kentucky, the researcher determined the mean *2014 Cohort Graduation Rates*

average to be 92.26 (SD = 4.67) as compared to the median score of 93.00. The distribution of

2014 Cohort Graduation Rates was negatively skewed with a positive kurtosis.

The researcher then used a box and whisker plot to analyze the *2014 Cohort Graduation*

Rates data set for outliers that could negatively impact the normality of the data set. In analyzing

the box and whisker plot, the researcher did not identify any outliers in the pK-12 public school

districts in the Paducah micropolitan (N = 12) data set, and identified one outlier (school district

39) in the remanding pK-12 public school districts (N = 156) in the state of Kentucky.

The researcher investigated the 2014 cohort graduation rates data sets for normality using

the Kolmogorov-Smirnov test for normality for both data sets. The Kolmogorov-Smirnov test

(D(12) = .160, p = .200) suggested the distribution of 2014 cohort graduation rates for the pK-12

public schools in the Paducah micropolitan area show normality. Since the Kolmogorov-

Smirnov test suggested the data set had normality. The Kolmogorov-Smirnov test (D(156) =

.079, p = .020) suggested the distribution of 2014 cohort graduation rates for the pK-12 public

schools in the remaining pK-12 public school districts in the state of Kentucky lacked normality.

Since the Kolmogorov-Smirnov test suggested the data set lacked normality, the researcher

chose to omit the outlier (school district 39) from the data set and reanalyze the two data sets

because the researcher believed that the removal of the outlier would not significantly affect the

data set.

Transformed 2014 Cohort Graduation Rates. Table 6 provides a frequency analysis

of the *Transformed 2014 Cohort Graduation Rates* with the outlier removed the graduating

seniors in the public pK-12 school districts in the Paducah micropolitan area (N = 12) and the

remaining public pK-12 school districts (N = 155) in the state of Kentucky with the one outlier

(school district 39) omitted from the data set.

Table 6

Transformed 2014 Cohort Graduation Rates Descriptive Statistics

	N	M	Mdn	SD	Skewness	Kurtosis
Paducah Micropolitan	12	93.53	93.65	3.27	-.725	.208
Rest of Kentucky	155	92.36	93.00	4.51	-.443	-.354

In analyzing the *Transformed 2014 Cohort Graduation Rates* of the pK-12 public schools

in the Paducah micropolitan (N = 12) area, the researcher determined the mean *Transformed*

2014 Cohort Graduation rates average to be 95.53 (SD = 3.27) as compared to the median score

of 93.65. The distribution of the *Transformed 2014 Cohort Graduation Rates* was negatively

skewed with a positive kurtosis.

In analyzing the *Transformed 2014 Cohort Graduation Rates* of the remaining pK-12

public schools (N = 155) with the outlier (school district 39) omitted in Kentucky, the researcher

determined the mean of the *Transformed 2014 Cohort Graduation Rates* average to be 92.36

(SD = .451) as compared to the median score of 93.00. The distribution of the *Transformed*

2014 Cohort Graduation Rates was negatively skewed with a negative kurtosis.

The researcher then used a box and whisker plot to analyze the *Transformed 2014 Cohort*

Graduation Rates data set with the one outlier (school district 39) removed to identify outliers in

the transformed data set that could negatively impact the normality of the data set. In analyzing

the box and whisker plot, the researcher did not identify any outliers in the pK-12 public school

districts in the Paducah micropolitan (N = 12) data set, and did not identify any outliers in the

remanding pK-12 public school districts (N = 155) in the state of Kentucky.

The researcher investigated the *Transformed 2014 Cohort Graduation Rates* data sets for

normality using the Kolmogorov-Smirnov test for normality for both data sets. The

Kolmogorov-Smirnov test (D(12) = .160, p = .200) suggested the distribution of the *Transformed*

2014 Cohort Graduation rates for the pK-12 public schools in the Paducah micropolitan area show normality. The Kolmogorov-Smirnov test (D(155) = .080, p = .017) suggested the distribution of *Transformed 2014 Cohort Graduation rates* for the pK-12 public schools in the remaining pK-12 public school districts in the state of Kentucky lacked normality using the Kolmogorov-Smirnov test. However, the researcher determined that the two samples were similar due to the similar skewness (-.725 for the pK-12 public schools in the Paducah micropolitan area and -.443 for the pK-12 public schools in the remaining portion of Kentucky). Thus, the *Transformed 2014 Cohort Graduation Rates* were determined to be approximately normally distributed by the researcher, and the data set was investigated using the Independent-samples t-test analysis.

An Independent-samples t-test was run using IBM SPSS to determine the if there was a statistically significant difference between the means of the *Transformed 2014 Cohort Graduation Rates* in the public pK-12 school districts in the Paducah micropolitan area and the remaining public pK-12 school districts in the state of Kentucky. The analysis showed there was a homogeneity of variances for the *Transformed 2014 Cohort Graduation Rates* for public pK-12 school districts in the Paducah micropolitan area compared to the remaining public pK-12 school in Kentucky, as assessed by Levene's test for equality of variances (p = .080). Since the data set met the assumption of homogeneity of variances, the Independent-sample t-test analysis was interpreted. The researcher determined there was not a statistically significant difference (p > .05) in the *Transformed 2014 Cohort Graduation Rates* between the pK-12 public schools in the Paducah micropolitan area and the remaining pK-12 public schools in Kentucky, M = 1.17, 95% CI [-1.45, 3.80], t(165) = .883, p = .378, d = .264.

2015 College and Career Readiness Rates. Table 7 provides a frequency analysis of

the *2015 College and Career Readiness Rates* for the graduating seniors in the public pK-12

school districts in the Paducah micropolitan area (N = 12) and the remaining public pK-12

school districts (N = 156) in the state of Kentucky.

Table 7

2015 College and Career Readiness Rates Descriptive Statistics

	N	M	Mdn	SD	Skewness	Kurtosis
Paducah Micropolitan	12	67.53	68.35	9.00	.570	-.177
Rest of Kentucky	156	68.66	70.05	10.22	-.375	1.193

In analyzing the *2015 College and Career Readiness Rates* of the pK-12 public schools

in the Paducah micropolitan (N = 12) area, the researcher determined the mean *2015 College and*

Career Readiness Rates average to be 67.53 (SD = 9.00) as compared to the median score of

67.53. The distribution of *2015 College and Career Readiness Rates* was positively skewed with

a negative kurtosis.

In analyzing the *2015 College and Career Readiness Rates* of the remaining pK-12

public schools (N = 156) in Kentucky, the researcher determined the mean *2015 College and*

Career Readiness Rates average to be 68.66 (SD = 10.22) as compared to the median score of

70.05. The distribution of *2015 College and Career Readiness Rates* was negatively skewed

with a positive kurtosis.

The researcher then used a box and whisker plot to analyze the *2015 College and Career*

Readiness Rates data set for outliers that could negatively impact the normality of the data set.

In analyzing the box and whisker plot, the researcher did not identify any outliers in the pK-12

public school districts in the Paducah micropolitan (N = 12) data set, and identified four outliers

(school district 21, 34, 82, and 117) in the remanding pK-12 public school districts (N = 156) in the state of Kentucky.

The researcher investigated the *2015 College and Career Readiness Rates* data sets for normality using the Kolmogorov-Smirnov test for normality for both data sets. The Kolmogorov-Smirnov test (D(12) = .105, p = .200) suggested the distribution of *2015 College and Career Readiness Rates* for the pK-12 public schools in the Paducah micropolitan area show normality. The Kolmogorov-Smirnov test (D(156) = .096, p = .001) suggested the distribution of *2015 College and Career Readiness Rates* for the pK-12 public schools in the remaining pK-12 public school districts in the state of Kentucky lacked normality. Since the Kolmogorov-Smirnov test suggested the data set lacked normality, the researcher chose to omit the outlier (school district 11, 85, 125, 150, and 151) from the data set and reanalyze the two data sets because the researcher believed that the removal of the outlier would not significantly affect the data set.

Transformed 2015 College and Career Readiness Rates. Table 8 provides a frequency analysis of the *Transformed 2015 College and Career Readiness Rates* for the graduating seniors in the public pK-12 school districts in the Paducah micropolitan area (N = 12) and the remaining public pK-12 school districts (N = 151) in the state of Kentucky.

Table 8

Transformed 2015 College and Career Readiness Rates Descriptive Statistics

	N	M	Mdn	SD	Skewness	Kurtosis
Paducah Micropolitan	12	57.53	68.35	9.00	.570	-.177
Rest of Kentucky	151	63.27	64.10	10.06	-.236	.072

In analyzing the *Transformed 2015 College and Career Readiness Rates* of the pK-12 public schools in the Paducah micropolitan (N = 12) area, the researcher determined the mean

Transformed 2015 College and Career Readiness Rates average to be 67.53 (SD = 9.00) as compared to the median score of 67.53. The distribution of *Transformed 2015 College and Career Readiness Rates* was positively skewed with a negative kurtosis.

In analyzing the *Transformed 2015 College and Career Readiness Rates* of the remaining pK-12 public schools (N = 151) in Kentucky, the researcher determined the mean *Transformed 2015 College and Career Readiness Rates* average to be 63.27 (SD = 10.06) as compared to the median score of 64.10. The distribution of *Transformed 2015 College and Career Readiness Rates* was negatively skewed with a positive kurtosis.

The researcher then used a box and whisker plot to analyze the 2015 college and career readiness rates data set for outliers that could negatively impact the normality of the data set. In analyzing the box and whisker plot, the researcher did not identify any outliers in the pK-12 public school districts in the Paducah micropolitan (N = 12) data set, and identified one outlier (school district 81) in the remanding pK-12 public school districts (N = 151) in the state of Kentucky.

The researcher investigated the *Transformed 2015 College and Career Readiness Rates* data sets for normality using the Kolmogorov-Smirnov test for normality for both data sets. The Kolmogorov-Smirnov test (D(12) = .179, p = .200) suggested the distribution of *Transformed 2015 College and Career Readiness Rates* for the pK-12 public schools in the Paducah micropolitan area show normality. The Kolmogorov-Smirnov test (D(151) = .050, p = .200) suggested the distribution of the *Transformed 2015 College and Career Readiness Rates* for the pK-12 public schools in the remaining pK-12 public school districts in the state of Kentucky show normality.

An Independent-samples t-test was run using IBM SPSS to determine the if there was a

statistically significant difference between the means of the *Transformed 2015 College and*

Career Readiness Rates in the public pK-12 school districts in the Paducah micropolitan area

and the remaining public pK-12 school districts in the state of Kentucky. The analysis showed

there was a homogeneity of variances for the *Transformed 2015 College and Career Readiness*

Rates for public pK-12 school districts in the Paducah micropolitan area compared to the

remaining public pK-12 school in Kentucky, as assessed by Levene's test for equality of

variances (p = .483). Since the data set met the assumption of homogeneity of variances, the

Independent-sample t-test analysis was interpreted. The researcher determined there was a

statistically significant difference (p < .05) in the *Transformed 2015 College and Career*

Readiness Rates between the pK-12 public schools in the Paducah micropolitan area and the

remaining pK-12 public schools in Kentucky, M = 5.69, 95% CI [0.37, 11.00], t(162) = 2.113, p

= .483, d = .635.

2015 Cohort Graduation Rates. Table 9 provides a frequency analysis of the *2015*

Cohort Graduation Rates for the graduating seniors in the public pK-12 school districts in the

Paducah micropolitan area (N = 12) and the remaining public pK-12 school districts (N = 156) in

the state of Kentucky.

Table 9

2015 Cohort Graduation Rates Descriptive Statistics

	N	M	Mdn	SD	Skewness	Kurtosis
Paducah Micropolitan	12	93.31	93.65	3.89	-.505	-.292
Rest of Kentucky	156	92.61	93.25	4.64	-.750	.435

In analyzing the *2015 Cohort Graduation Rates* of the pK-12 public schools in the

Paducah micropolitan (N = 12) area, the researcher determined the mean *2015 Cohort*

Graduation Rates average to be 93.31 (SD = 3.89) as compared to the median score of 93.65.

The distribution of *2015 Cohort Graduation Rates* was negatively skewed with a negative

kurtosis.

In analyzing the *2015 Cohort Graduation Rates* of the remaining pK-12 public schools

(N = 156) with the outlier (school district 39) omitted in Kentucky, the researcher determined the

mean *2015 Cohort Graduation Rates* average to be 92.61 (SD = 4.64) as compared to the median

score of 93.25. The distribution of *2015 Cohort Graduation Rates* was negatively skewed with a

positive kurtosis.

The researcher then used a box and whisker plot to analyze the *2015 Cohort Graduation*

Rates data set to identify outliers in the data set that could negatively impact the normality of the

data set. In analyzing the box and whisker plot, the researcher did not identify any outliers in the

pK-12 public school districts in the Paducah micropolitan (N = 12) data set, and identified four

outliers (school district 21, 34, 82, and 117) in the remanding pK-12 public school districts (N =

156) in the state of Kentucky.

The researcher investigated the *2015 Cohort Graduation Rates* data sets for normality

using the Kolmogorov-Smirnov test for normality for both data sets. The Kolmogorov-Smirnov

test (D(12) = .105, p = .200) suggested the distribution of *2015 Cohort Graduation Rates* for the

pK-12 public schools in the Paducah micropolitan area show normality. The Kolmogorov-

Smirnov test (D(156) = .096, p = .001) suggested the distribution of *2015 Cohort Graduation*

Rates for the pK-12 public schools in the remaining pK-12 public school districts in the state of

Kentucky lacked normality.

Transformed 2015 Cohort Graduation Rates. Table 10 provides a frequency analysis

of the *Transformed 2015 Cohort Graduation Rates* for the graduating seniors in the public pK-12

school districts in the Paducah micropolitan area (N = 12) and the remaining public pK-12

school districts (N = 152) in the state of Kentucky with the four outliers (school district 21, 34,

82, and 117) omitted from the data set.

Table 10

Transformed 2015 Cohort Graduation Rates Descriptive Statistics

	N	M	Mdn	SD	Skewness	Kurtosis
Paducah Micropolitan	12	93.31	93.65	3.89	-.505	-.292
Rest of Kentucky	152	92.28	93.40	4.17	-.464	-.226

In analyzing the *Transformed 2015 Cohort Graduation Rates* of the pK-12 public schools

in the Paducah micropolitan (N = 12) area, the researcher determined the mean *Transformed*

2015 Cohort Graduation Rates average to be 93.31 (SD = 3.89) as compared to the median score

of 93.65. The distribution of *Transformed 2015 Cohort Graduation Rates* was positively skewed

with a positive kurtosis.

In analyzing the *Transformed 2015 Cohort Graduation Rates* of the remaining pK-12

public schools (N = 152) with the outliers (school district 21, 34, 82, and 117) omitted in

Kentucky, the researcher determined the mean *Transformed 2015 Cohort Graduation Rates*

average to be 92.28 (SD = 4.17) as compared to the median score of 93.40. The distribution of

Transformed 2015 Cohort Graduation Rates was positively skewed with a positive kurtosis.

The researcher then used a box and whisker plot to analyze the *Transformed 2015 Cohort*

Graduation Rates data set with the four outliers (school district 21, 34, 82, and 117) removed to

identify outliers in the transformed data set that could negatively impact the normality of the data

set. In analyzing the box and whisker plot, the researcher did not identify any outliers in the pK-

12 public school districts in the Paducah micropolitan (N = 12) data set, and did not identified

any outliers in the remanding pK-12 public school districts (N = 152) in the state of Kentucky.

The researcher investigated the *Transformed 2015 Cohort Graduation Rates* data sets for

normality using the Kolmogorov-Smirnov test for normality for both data sets. The

Kolmogorov-Smirnov test (D(12) = .105, p = .200) suggested the distribution of 2015 cohort

graduation rates for the pK-12 public schools in the Paducah micropolitan area show normality.

The Kolmogorov-Smirnov test (D(152) = .076, p = .031) suggested the distribution of

Transformed 2015 Cohort Graduation Rates for the pK-12 public schools in the remaining pK-

12 public school districts in the state of Kentucky lacked normality. The researcher determined

that the two samples were similar due to the similar skewness (-.505 for the pK-12 public

schools in the Paducah micropolitan area and -.464 for the pK-12 public schools in the remaining

portion of Kentucky). Thus, the *Transformed 2015 Cohort Graduation Rates* were determined

to be approximately normally distributed by the researcher, and the data set was investigated

using the Independent-samples t-test analysis.

An Independent-samples t-test was run using IBM SPSS to determine the if there was a

statistically significant difference between the means of the *Transformed 2015 Cohort*

Graduation Rates in the public pK-12 school districts in the Paducah micropolitan area and the

remaining public pK-12 school districts in the state of Kentucky. The analysis showed there was

a homogeneity of variances for the *Transformed 2015 Cohort Graduation Rates* for public pK-

12 school districts in the Paducah micropolitan area compared to the remaining public pK-12

school in Kentucky, as assessed by Levene's test for equality of variances (p = .766). Since the

data set met the assumption of homogeneity of variances, the Independent-sample t-test analysis

was interpreted. The researcher determined there was not a statistically significant difference (p

> .05) in the *Transformed 2015 Cohort Graduation Rates* between the pK-12 public schools in

the Paducah micropolitan area and the remaining pK-12 public schools in Kentucky, M = .36,

95% CI [-2.10, 2.81], t(162) = .287, p = .775, d = .086.

2016 College and Career Readiness Rates. Table 11 provides a frequency analysis of

the *2016 College and Career Readiness Rates* for the graduating seniors in the public pK-12

school districts in the Paducah micropolitan area (N = 12) and the remaining public pK-12

school districts (N = 156) in the state of Kentucky.

Table 11

2016 College and Career Readiness Rates Descriptive Statistics

	N	M	Mdn	SD	Skewness	Kurtosis
Paducah Micropolitan	12	76.08	77.50	5.57	-.208	.681
Rest of Kentucky	156	70.65	71.60	10.76	-.577	1.460

In analyzing the *2016 College and Career Readiness Rates* of the pK-12 public schools

in the Paducah micropolitan (N = 12) area, the researcher determined the mean *2016 College and

Career Readiness Rates* average to be 76.08 (SD = 5.57) as compared to the median score of

77.50. The distribution of *2016 College and Career Readiness Rates* was negatively skewed

with a positive kurtosis.

In analyzing the *2016 College and Career Readiness Rates* of the remaining pK-12

public schools (N = 156) in Kentucky, the researcher determined the mean *2016 College and

Career Readiness Rates* average to be 70.65 (SD = 10.76) as compared to the median score of

71.60. The distribution of *2016 College and Career Readiness Rates* was negatively skewed

with a positive kurtosis.

The researcher then used a box and whisker plot to analyze the *2016 College and Career

Readiness Rates* data set for outliers that could negatively impact the normality of the data set.

In analyzing the box and whisker plot, the researcher did not identify any outliers in the pK-12 public school districts in the Paducah micropolitan (N = 12) data set, and identified four outliers (school district 41, 142, and 150) in the remanding pK-12 public school districts (N = 156) in the state of Kentucky.

The researcher investigated the *2016 College and Career Readiness Rates* data sets for normality using the Kolmogorov-Smirnov test for normality for both data sets. The Kolmogorov-Smirnov test (D(12) = .183, p = .200) suggested the distribution of *2016 College and Career Readiness Rates* for the pK-12 public schools in the Paducah micropolitan area show normality. The Kolmogorov-Smirnov test (D(156) = .070, p = .060) suggested the distribution of *2016 College and Career Readiness Rates* for the pK-12 public schools in the remaining pK-12 public school districts in the state of Kentucky show normality. Since the Kolmogorov-Smirnov test suggested the data set had normality, the researcher chose to ignore the three outliers (school district 41, 142, and 150) in the data set.

An Independent-samples t-test was run using IBM SPSS to determine the if there was a statistically significant difference between the means of the *2016 College and Career Readiness Rates* in the public pK-12 school districts in the Paducah micropolitan area and the remaining public pK-12 school districts in the state of Kentucky. The analysis showed there was a homogeneity of variances for the *2016 College and Career Readiness Rates* for public pK-12 school districts in the Paducah micropolitan area compared to the remaining public pK-12 school in Kentucky, as assessed by Levene's test for equality of variances (p = .064). Since the data set met the assumption of homogeneity of variances, the Independent-sample t-test analysis was interpreted. The researcher determined there was not a statistically significant difference (p > .05) in the *2016 College and Career Readiness Rates* between the pK-12 public schools in the

Paducah micropolitan area and the remaining pK-12 public schools in Kentucky, M = 5.42, 95%

CI [-0.79, 11.63], t(166) = 1.724, p = .087, d = .516.

2016 Cohort Graduation Rates. Table 12 provides a frequency analysis of the *2016*

Cohort Graduation Rates for the graduating seniors in the public pK-12 school districts in the

Paducah micropolitan area (N = 12) and the remaining public pK-12 school districts (N = 156) in

the state of Kentucky.

Table 12

2016 Cohort Graduation Rates Descriptive Statistics

	N	M	Mdn	SD	Skewness	Kurtosis
Paducah Micropolitan	12	94.35	94.85	2.83	-1.272	1.908
Rest of Kentucky	156	93.01	93.80	4.55	-1.177	2.227

In analyzing the *2016 Cohort Graduation Rates* of the pK-12 public schools in the

Paducah micropolitan (N = 12) area, the researcher determined the mean *2016 Cohort*

Graduation Rates average to be 94.35 (SD = 2.83) as compared to the median score of 94.85.

The distribution of *2016 Cohort Graduation Rates* was negatively skewed with a positive

kurtosis.

In analyzing the *2016 Cohort Graduation Rates* of the remaining pK-12 public schools

(N = 156) in Kentucky, the researcher determined the mean *2016 Cohort Graduation Rates*

average to be 93.01 (SD = 4.55) as compared to the median score of 93.80. The distribution of

2016 Cohort Graduation Rates was negatively skewed with a positive kurtosis.

The researcher then used a box and whisker plot to analyze the *2016 Cohort Graduation*

Rates data set to identify outliers in the data set that could negatively impact the normality of the

data set. In analyzing the box and whisker plot, the researcher did not identify any outliers in the

pK-12 public school districts in the Paducah micropolitan (N = 12) data set, and identified three

outliers (school district 41, 142, and 150) in the remanding pK-12 public school districts (N = 156) in the state of Kentucky.

The researcher investigated the *2016 Cohort Graduation Rates* data sets for normality using the Kolmogorov-Smirnov test for normality for both data sets. The Kolmogorov-Smirnov test (D(12) = .257, p =. 028) suggested the distribution of *2016 Cohort Graduation Rates* for the pK-12 public schools in the Paducah micropolitan area lacked normality. The Kolmogorov-Smirnov test (D(156) = .109, p = .000) suggested the distribution of *2016 Cohort Graduation Rates* for the pK-12 public schools in the remaining pK-12 public school districts in the state of Kentucky lacked normality. Since the Kolmogorov-Smirnov test suggested the data set lacked normality, the researcher chose to omit the outliers (school district 42, 141, and 150) from the data set and reanalyze the two data sets because the researcher believed that the removal of the outliers would not significantly affect the data set.

Transformed 2016 Cohort Graduation Rates. Table 13 provides a frequency analysis of the *Transformed 2016 Cohort Graduation Rates* for the graduating seniors in the public pK-12 school districts in the Paducah micropolitan area (N = 12) and the remaining public pK-12 school districts (N = 152) in the state of Kentucky with the three outliers (school district 42, 141, and 150) omitted from the data set.

Table 13

Transformed 2016 Cohort Graduation Rates Descriptive Statistics

	N	M	Mdn	SD	Skewness	Kurtosis
Paducah Micropolitan	11	94.96	95.00	1.99	-.667	1.242
Rest of Kentucky	152	93.41	93.90	3.87	-.569	.104

In analyzing the *Transformed 2016 Cohort Graduation Rates* of the pK-12 public schools in the Paducah micropolitan (N = 11) area, the researcher determined the mean *Transformed*

2016 Cohort Graduation Rates average to be 94.96 (SD = 1.99) as compared to the median score

of 95.00. The distribution of *Transformed 2016 Cohort Graduation Rates* was negatively

skewed with a normal kurtosis.

In analyzing the *Transformed 2016 Cohort Graduation Rates* of the remaining pK-12

public schools (N = 152) with the outliers (school district 21, 34, 82, and 117) omitted in

Kentucky, the researcher determined the mean *Transformed 2016 Cohort Graduation Rates*

average to be 93.41 (SD = 3.87) as compared to the median score of 93.90. The distribution of

Transformed 2016 Cohort Graduation Rates was negatively skewed with a normal kurtosis.

The researcher then used a box and whisker plot to analyze the *Transformed 2016 Cohort*

Graduation Rates data set with the five outliers (school district 42, 131, 141, and 150) removed

to identify outliers in the transformed data set that could negatively impact the normality of the

data set. In analyzing the box and whisker plot, the researcher identify one outlier (school

district 25) in the pK-12 public school districts in the Paducah micropolitan (N = 11) data set,

and identified two outliers (school district 39 and 45)in the remanding pK-12 public school

districts (N = 152) in the state of Kentucky.

The researcher investigated the *Transformed 2016 Cohort Graduation Rates* data sets for

normality using the Kolmogorov-Smirnov test for normality for both data sets. The

Kolmogorov-Smirnov test (D(11) = .208, p =.198) suggested the distribution of *Transformed*

2016 Cohort Graduation Rates for the pK-12 public schools in the Paducah micropolitan area

show normality. The Kolmogorov-Smirnov test (D(152) =.081, p =.016) suggested the

distribution of *Transformed 2016 Cohort Graduation Rates* for the pK-12 public schools in the

remaining pK-12 public school districts in the state of Kentucky lacked normality. The

researcher determined that the two samples were similar due to the similar skewness (-.667 for

the pK-12 public schools in the Paducah micropolitan area and -.569 for the pK-12 public schools in the remaining portion of Kentucky). Thus, the *Transformed 2016 Cohort Graduation Rates* were determined to be approximately normally distributed by the researcher, and the data set was investigated using the Independent-samples t-test analysis.

An Independent-samples t-test was run using IBM SPSS to determine the if there was a statistically significant difference between the means of the *Transformed 2016 Cohort Graduation Rates* in the public pK-12 school districts in the Paducah micropolitan area and the remaining public pK-12 school districts in the state of Kentucky. The analysis showed the data set lacked a homogeneity of variances for the *Transformed 2016 Cohort Graduation Rates* for public pK-12 school districts in the Paducah micropolitan area compared to the remaining public pK-12 school in Kentucky, as assessed by Levene's test for equality of variances (p = .021). Since the data set did not met the assumption of homogeneity of variances, the IBM SPSS output where equal variances were not assumed for the Independent-sample t-test analysis was interpreted. The researcher determined there was a statistically significant difference (p < .05) in the *Transformed 2016 Cohort Graduation Rates* between the pK-12 public schools in the Paducah micropolitan area and the remaining pK-12 public schools in Kentucky, M = 1.55, 95% CI [-0.11, 2.98], t(16.152) = 2.287, p = .036, d = .409.

Four-Year Change in College and Career Readiness Rates. Table 14 provides a frequency analysis of the *Four-Year Change in College and Career Readiness Rates* for the graduating seniors in the public pK-12 school districts in the Paducah micropolitan area (N = 12) and the remaining public pK-12 school districts (N = 156) in the state of Kentucky.

Table 14

Four-Year Change in College and Career Readiness Rates Descriptive Statistics

	N	M	Mdn	SD	Skewness	Kurtosis
Paducah Micropolitan	12	13.92	13.75	12.25	.126	-1.307
Rest of Kentucky	156	16.35	14.45	13.32	.801	1.919

In analyzing the *Four-Year Change in College and Career Readiness Rates* of the pK-12 public schools in the Paducah micropolitan (N = 12) area, the researcher determined the mean *four-year college and career readiness rates* average to be 13.92 (SD = 12.25) as compared to the median score of 13.75. The distribution of *Four-Year Change in College and Career Readiness Rates* was positively skewed with a negative kurtosis.

In analyzing the *Four-Year Change in College and Career Readiness Rates* of the remaining pK-12 public schools (N = 156) in Kentucky, the researcher determined the mean *Four-Year Change in College and Career Readiness Rates* average to be 16.35 (SD = 13.32) as compared to the median score of 14.45. The distribution of *Four-Year Change in College and Career Readiness Rates* was positively skewed with a positive kurtosis.

The researcher then used a box and whisker plot to analyze the *Four-Year Change in College and Career Readiness Rates* data set for outliers that could negatively impact the normality of the data set. In analyzing the box and whisker plot, the researcher did not identify any outliers in the pK-12 public school districts in the Paducah micropolitan (N = 12) data set, and identified one outlier (school district 142) in the remanding pK-12 public school districts (N = 156) in the state of Kentucky.

The researcher investigated the *four-year college and career readiness rates* data sets for normality using the Kolmogorov-Smirnov test for normality for both data sets. The Kolmogorov-Smirnov test (D(12) = .148, p = .200) suggested the distribution *of four-year*

college and career readiness rates for the pK-12 public schools in the Paducah micropolitan area show normality. The Kolmogorov-Smirnov test (D(156) = .069, p = .064) suggested the distribution of *four-year college and career readiness rates* for the pK-12 public schools in the remaining pK-12 public school districts in the state of Kentucky show normality. Since the Kolmogorov-Smirnov test suggested the data set had normality, the researcher chose to ignore the outlier (school district 132) in the data set.

An Independent-samples t-test was run using IBM SPSS to determine the if there was a statistically significant difference between the means of the *Four-Year Change in College and Career Readiness Rates* in the public pK-12 school districts in the Paducah micropolitan area and the remaining public pK-12 school districts in the state of Kentucky. The analysis showed there was a homogeneity of variances for the *Four-Year Change in College and Career Readiness Rates* for public pK-12 school districts in the Paducah micropolitan area compared to the remaining public pK-12 school in Kentucky, as assessed by Levene's test for equality of variances (p = .064). Since the data set met the assumption of homogeneity of variances, the Independent-sample t-test analysis was interpreted. The researcher determined there was not a statistically significant difference (p > .05) in the *Four-Year Change in College and Career Readiness Rates* between the pK-12 public schools in the Paducah micropolitan area and the remaining pK-12 public schools in Kentucky, M = -2.43, 95% CI [-10.20, 5.34], t(166) = -.618, p = .538, d = .018.

Four-Year Change in Cohort Graduation Rates. Table 15 provides a frequency analysis of the *Four-Year Change in Cohort Graduation Rates* for the graduating seniors in the public pK-12 school districts in the Paducah micropolitan area (N = 12) and the remaining public pK-12 school districts (N = 156) in the state of Kentucky.

Table 15

Four-Year Change in Cohort Graduation Rates Descriptive Statistics

	N	M	Mdn	SD	Skewness	Kurtosis
Paducah Micropolitan	12	2.35	2.40	2.34	.130	-.719
Rest of Kentucky	156	2.38	1.85	4.52	.928	3.878

In analyzing the *Four-Year Change in Cohort Graduation Rates* of the pK-12 public schools in the Paducah micropolitan (N = 12) area, the researcher determined the mean *Four-Year Change in Cohort Graduation Rates* average to be 2.38 (SD = 2.34) as compared to the median score of 2.40. The distribution of *Four-Year Change in Cohort Graduation Rates* was positively skewed with a negative kurtosis.

In analyzing the *Four-Year Change in Cohort Graduation Rates* of the remaining pK-12 public schools (N = 156) in Kentucky, the researcher determined the mean *Four-Year Change in Cohort Graduation Rates* average to be 2.38 (SD = 4.52) as compared to the median score of 1.85. The distribution of *Four-Year Change in Cohort Graduation Rates* was positively skewed with a positive kurtosis.

The researcher then used a box and whisker plot to analyze the *Four-Year Change in Cohort Graduation Rates* data set for outliers that could negatively impact the normality of the data set. In analyzing the box and whisker plot, the researcher did not identify any outliers in the pK-12 public school districts in the Paducah micropolitan (N = 12) data set, and identified five outliers (school district 21, 39, 62, 150 and 157 with school district 39 being an extreme outlier) in the remanding pK-12 public school districts (N = 156) in the state of Kentucky.

The researcher investigated the *four-year cohort graduation rates* data sets for normality using the Kolmogorov-Smirnov test for normality for both data sets. The Kolmogorov-Smirnov test (D(12) = .1208, p = .200) suggested the distribution of *four-year cohort graduation rates* for

the pK-12 public schools in the Paducah micropolitan area show normality. The Kolmogorov-

Smirnov test (D(156) = .094, p = .002) suggested the distribution of *four-year cohort graduation*

rates for the pK-12 public schools in the remaining pK-12 public school districts in the state of

Kentucky lack normality. Since the Kolmogorov-Smirnov test suggested the data set lacked

normality, the researcher chose to omit the outliers (school district 21, 39, 62, 150 and 157 with

school district 39 being an extreme outlier) from the data set and reanalyze the two data sets

because the researcher believed that the removal of the outliers would not significantly affect the

data set.

   Transformed Four-Year Change in Cohort Graduation Rates. Table 16 provides a

frequency analysis of the *Transformed Four-Year Change in Cohort Graduation Rates* for the

graduating seniors in the public pK-12 school districts in the Paducah micropolitan area (N = 12)

and the remaining public pK-12 school districts (N = 151) in the state of Kentucky.

Table 16

Transformed Four-Year Change in Cohort Graduation Rates Descriptive Statistics

	N	M	Mdn	SD	Skewness	Kurtosis
Paducah Micropolitan	12	2.35	2.40	2.34	-.130	2.134
Rest of Kentucky	151	2.16	1.80	3.62	.299	-.075

   In analyzing the *transformed Four-Year Change in Cohort Graduation Rates* of the pK-

12 public schools in the Paducah micropolitan (N = 12) area, the researcher determined the mean

Transformed Four-Year Change in Cohort Graduation Rates average to be 2.35 (SD = 2.34) as

compared to the median score of 2.40. The distribution of *transformed Four-Year Change in*

Cohort Graduation Rates was negatively skewed with a positive kurtosis.

   In analyzing the *Transformed Four-Year Change in Cohort Graduation Rates* of the

remaining pK-12 public schools (N = 151) in Kentucky, the researcher determined the mean

Transformed Four-Year Change in Cohort Graduation Rates average to be 2.16 (SD = 3.62) as compared to the median score of 1.80. The distribution of the *Transformed Four-Year Change in Cohort Graduation Rates* was positively skewed with a negative kurtosis.

The researcher then used a box and whisker plot to analyze the T*ransformed Four-Year Change in Cohort Graduation Rates* data set for outliers that could negatively impact the normality of the data set. In whisker plot, the researcher did not identify any outliers in the pK-12 analyzing the box and public school districts in the Paducah micropolitan (N = 12) data set, and identified one outlier (school district 33) in the remanding pK-12 public school districts (N = 151) in the state of Kentucky.

The researcher investigated the T*ransformed Four-Year Change in Cohort Graduation Rates* data sets for normality using the Kolmogorov-Smirnov test for normality for both data sets. The Kolmogorov-Smirnov test (D(12) = .120, p = .200) suggested the distribution of change in T*ransformed Four-Year Change in Cohort Graduation Rates* for the pK-12 public schools in the Paducah micropolitan area show normality. The Kolmogorov-Smirnov test (D(151) = .070, p = .067) suggested the distribution of the change in T*ransformed Four-Year Change in Cohort Graduation Rates* for the pK-12 public schools in the remaining pK-12 public school districts in the state of Kentucky show normality. Since the Kolmogorov-Smirnov test suggested the data set had normality, the researcher chose to ignore the outlier (school district 33) in the data set.

An Independent-samples t-test was run using IBM SPSS to determine the if there was a statistically significant difference between the means of the T*ransformed Four-Year Change in Cohort Graduation Rates* in the public pK-12 school districts in the Paducah micropolitan area and the remaining public pK-12 school districts in the state of Kentucky. The analysis showed

there was a homogeneity of variances for the T*ransformed Four-Year Change in Cohort*

Graduation Rates for public pK-12 school districts in the Paducah micropolitan area compared

to the remaining public pK-12 school in Kentucky, as assessed by Levene's test for equality of

variances (p = .122). Since the data set met the assumption of homogeneity of variances, the

Independent-sample t-test analysis was interpreted. The researcher determined there was not a

statistically significant difference (p > .05) in the T*ransformed Four-Year Change in Cohort*

Graduation Rates between the pK-12 public schools in the Paducah micropolitan area and the

remaining pK-12 public schools in Kentucky, M = .16, 95% CI [-1.94, 2.26], t(161) = .151, p =

.880, d = .045.

Qualitative Findings and Analysis

For the qualitative portion of the mixed methods study, the researcher interviewed two

different sample sets (instructional supervisors of pK-12 school districts and presidents or human

resource directors from industry) from the Paducah micropolitan area that are responsible for

either the pK-12 learning and preparedness for postsecondary and workforce transition or the

hiring and development of employees entering into the workforce. The interviews were

structured to determine if a significant gap exists between workforce preparedness and current

workforce needs. At the point the researcher stopped hearing new information, the researcher

determined that data saturation had been obtained. Upon obtaining data saturation for both the

instructional supervisors and industry leaders, the researcher concluded the data gathering

through interviews. Using the online program dedoose.com, the interviews were coded and

examined as major themes emerged. Three major themes emerged through the qualitative

process emerged and will be discussed with specific quotes given by interviewees.

Background of Sample

The population (N = 12) of the interviews consisted of eight Kentucky public school instructional supervisors from the Paducah micropolitan area that are responsible for district-wide curriculum, instruction, and assessment. In addition, four senior level executives of major employers in the Paducah micropolitan area who are in charge of hiring and employee development were interviewed. For each of the twelve interviews, the interviews were recorded and then transcribed by the researcher.

Interviews

Throughout the interview process, the researcher continued to analyze the data that was obtained from each of the interviewees (Maxwell, 2013).   After transcribing the interviews, the researcher uploaded the transcriptions into the online program dedoose.com. Using dedoose.com, the researcher analysis began with a broad application of the coding system based on the literature review and the research questions for the study. The initial coding system developed from the literature review was revised into more specific codes and sub codes throughout the coding process.

Analysis

From the interviews, the three following major themes were identified for the Paducah micropolitan area: Lack of Alignment Between pK-12 Academic Focus and Workforce Needs; Need for Focus on Teaching Essential Employment Skills by pK-12 Public Schools; and, Need for Direct Communication Between pK-12 Public Schools and Local Industry.

> **Theme I**: **Lack of Alignment Between pK-12 Academic Focus and Workforce Needs.**

This major theme was broken into two sub-categories. First, instructional supervisors expressed that the focus of learning for the district was aligned to the state of Kentucky's public school

accountability model. The accountability model in Kentucky measures academic knowledge

needed for success in towards college and career readiness.

Schools focused on state accountability. This section describes the pK-12 public school

districts in the Paducah micropolitan area focus on the state accountability model for the

academic outcomes of their graduates. When question as to what were the academic indicators

that their districts were focused on, all of the instructional supervisors specifically mentioned

measures in the state accountability formula. "We put value into state testing which is like every

other district in the state of Kentucky" (Instructional Supervisor 8); "obviously, we use all the

ones from the (state of Kentucky) Unbridled Learning model" (Instructional Supervisor 6); and,

"we use K-PREP (Kentucky Progress Report for Educational Progress)" (Instructional

Supervisor 2).

Specifically the instructional supervisors described the most important academic

indicators of their perspective districts as focused on the Kentucky Core Academic Standards

(Kentucky's name for the statewide implementation of the Common Core Academic Standards)

and the ACT which college readiness is determined by in Kentucky ("College Readiness

Indicators, 2016"). Instructional Supervisor 7 emphasized the importance of state testing by

saying "that is what we work with our teachers on. We want to make sure that they take those

(state standards) to the nth degree, and when our students sit down and take (state) assessments in

the spring they are ready."

Preparing students for the ACT as the main portion of college readiness in the state of

Kentucky was described as a major focus of all of the instructional supervisors who were

interviewed. "You know ACT is huge so we have to make sure we prepare the kids not only for

the material but what the test is like so they don't have anxiety about it. So we use…25 minutes

a day sometimes to prep them" (Instructional Supervisor 4). In addition to allotting time during

the school day to prepare students for the ACT test, some districts have allocated resources for

one-on-one help for students who have not met the state required benchmarks to be considered

college ready. "We have spent a lot of time and resources on devoting a little more one-on-one

time with kids that need the extra attention to be college ready" (Instructional Supervisor 6).

In the interest of educational alignment to workforce needs, T*he American Diploma Project*

called for state educational systems to use performance indicators to drive all students toward

college and career readiness (Cohen, 2008). *The American Diploma Project* identified academic

indicators in elementary schools and middle schools to provide an early indicator as to if a

student is on target to meet the college readiness benchmarks upon graduation from high school

and transition to postsecondary education or directly into the workforce based on summative

assessment scores in third and eighth grade and grades achieved in English Language Arts and

mathematics aligned to CCSS in sixth and eighth grades (Achieve, Inc., 2013).

The instructional supervisors' interviews suggest that the Paducah micropolitan area pK-

12 schools are focused on some of the academic indicators that the research from *The American*

Diploma Project recommends to prepare students for postsecondary and workforce success.

However, in the interviews the majority of the instructional supervisors did not mention the

importance of teaching and none mentioned the importance of assessing the essential 21st century

skills identified in the Educational Testing System's report *Identifying the Most Important 21st*

Century Workforce Competencies: An Analysis of the Occupational Information Network

(Burrus et. al, 2013).

Schools are not focused on assessing key workforce skills. The public pK-12 schools in

the Paducah micropolitan area are focused on teaching the standards that are measured in the

Kentucky's educational accountability system and not the most important skills identified in the

Educational Testing System's analysis of the most important 21st century skills for the global

economy identified from the United States Department of Labor's Occupational Informational

Network [O*NET] database. The notion of preparing students in pK-12 public schools to

compete in the global economy seems challenging given that one instructional supervisor made

the statement "we are still trying to get our teachers to understand what the global economy is"

(Instructional Supervisor 1).

From the interviews with instructional supervisors, the data suggests that there is almost

no intentional focus on preparing the students in the Paducah micropolitan area for the skills

(problem solving, fluid intelligence, innovation, teamwork, and communication skills) identified

by the O*NET database research (Burrus et. al, 2013). In the discussion of how the school

districts are preparing students for the workforce that is required by the global economy,

Instructional Supervisor 3 stated "I'm not sure we are doing it. I'm not sure we are preparing

students for the workforce for the global economy."

In Chapter 1, Table 1 illustrates the research from Georgetown University Center on

Education and the Workforce for the change in Educational Employment for Educational

Attainment in the United States. The analysis of the research shows that ninety-nine percent of

the workers hired, or 11.5 million, in the total jobs created in from January 2010 through January

2016 went to a worker with at least some college education (Carnevale et. al, 2016). In

discussing how the district prepares students for the workforce that is required by the global

economy, Instructional Supervisor 7 stated "I think that for a college-bound student that it is

important that we focus on college readiness standards." Thus, the district's focus seems to be

only on the college readiness benchmarks for students who want to go to college and not on the

essential 21st century workforce skills identified by the O*NET database research.

In addition, Instructional Supervisor 2 stated "our district measures key workforce skills

outside of the academic areas (of reading, writing, and math) by looking at our college and career

readiness numbers." The interviews suggest that school districts' curriculum alignment efforts

suggest that "workforce skills" are only a focus for those who are taking classes in a career

pathway that is recognized by the state accountability system. Workforce readiness was

routinely equated with only the pathways provided through Kentucky's Area Technical Centers

(ATC). "We obviously look at can our kids go into the workforce. Those kids that are not on a

college path, and can they go into the workforce. (We) use that with our career ready piece and

even those kids' who have not gone into a full pathway…are those kids success at our ATC"

(Instructional Supervisor 6).

Seven of the eight instructional supervisors did not specifically mention teaching and

assessing the essential workforce skills from the O*NET database research conducted by the

Educational Testing System. In response to how the district measures key workforce skills

needed in the global economy, Instructional Supervisor 3 stated "I don't know that we are

tracking (them). I think it is done more by the classroom teacher, and I know the ATC principal

does. Now as far as how the district tracks it, I don't think that we are involved in that…(we)

probably should be."

Only one instructional supervisor mentioned specifically mentioned strategies for

teaching students 21st century skills through problem based learning training for the teachers in

the district. Specifically, the district is focused on teaching critical thinking skills or problem

solving, communication skills, and collaboration of teams. These essential 21st century skills are

included in the district's graduate profile that identifies the skills the district wants students to

leave high school with. However when asked how the district measures key workforce skills

outside of academic knowledge in reading, writing, and math, Instructional Supervisor 1 stated

"right now we have no good way to measure that."

The interviews with the instructional supervisors suggest that the pK-12 school districts

in the Paducah micropolitan area have not adjusted instructional strategies or made curriculum

adjustments to prepare their graduates for the global economy. Thus, the researcher suggests that

the school districts are fixed in the "transition model" of education. In *Learning 21st-Century*

Skills Requires 21st-Century Teaching (2012) Anna Rosefsky Saavedra and V. Darleen Opfer

suggested that students only learn critical information in the transition model of education. The

interviews with the instructional supervisors suggests the districts are focused primarily on

learning for the state assessments which are predominantly multiple choice tests with some short

answers or extended responses. Research suggests that to teach students the essential 21st

century skills students need practice applying knowledge to new contexts, using it to solve

problems, or communicating the new knowledge to others in complex ways (OCED, 2012;

Rosefsky Saavedra & Opfer, 2012). For the students in the Paducah micropolitan area to be

prepared for the workforce demands of the global economy, students need opportunities to

practice and develop essential 21st century skills in addition to being academically prepared for

college or the workforce (Frizzell, et. al, 2017).

Theme II: Need for Focus on Teaching Essential Employment Skills by pK-12

Public Schools. Theme I suggests that the pK-12 public school districts in the Paducah

micropolitan area are focused on teaching the required knowledge to perform well on the state

assessments. The interviews of the instructional supervisors suggested there was minimal

intention focus on teaching essential 21st century workforce skills such as problem solving, fluid intelligence, innovation, communication, and teamwork and no intentional focus on how to assess essential workforce skills throughout the public pK-12 school districts in the Paducah micropolitan area. However, the interviews of human resource directors and presidents of some of the largest employers in the Paducah micropolitan area suggests that four of the five skills are needed and are missing in new employees in their companies.

Problem-solving was identified as the most needed skill that new employees are missing by the workforce interviews. "[Our company] needs employees that have the ability to think critically and solve problems…those are the largest requirements of the people we hire on the technical side" (Workforce Interviewee 4). Each of the workforce interviewees suggested that problem solving skills were lacking in new employees. Workforce Interviewee 4 stated that the new employees that the company hires "have not been taught how to use logic to figure out where the problem is coming from, why it is a problem, and how to resolve [the problem]." Workforce Interviewee 4 also stated that they hire people "that are smart people; but, they have not been taught how to solve a problem." Workforce Interviewee 1 shared that the company has to teach its new employees critical thinking skills to help the new employees develop their missing problem solving skills.

The workforce interviews suggested that communication is the second most important skill needed of new employees. "In general, (public pK-12 schools should) offer more training in communication skills and public speaking" (Workforce Interviewee 3). Communication skills include both written and verbal communication, but the interviews suggest that written communication skills are more lacking than verbal communication skills. In response to what skills are lacking, Workforce Interviewee 4 stated "Communication skills; writing, and verbal

communication…writing as much as verbal communication in that these individuals often times need to report on things. They do that more by writing than verbally."

In addition to improved problem solving and written and verbal communication of new employees, the lack of fluid intelligence and the ability to work as part of a team were identified as missing essential employment skills. However, the ability to be innovative was not specifically identified as a need of employees through the workforce interviews.

Throughout the instructional supervisors' interviews, the constant focus on learning for each district was aligned to the end of the year state accountability system and did not include teaching and assessing critical workforce skills or competencies. The major focus within the state assessments that instructional supervisors connected with workforce readiness for the global economy was the college and career readiness indicators. Instructional Supervisor 5 stated "Whether it be on a worldwide level or just in a small community level, we believe that [graduates] need to be college and career ready." The thought that basic knowledge in reading, writing, and mathematics is enough to ensure graduates are ready to compete in the global workforce is illustrated throughout Theme I. Instructional supervisors equate reaching Kentucky's benchmarks on the ACT in English, mathematics, and reading as being ready for the global workforce or meeting Kentucky's career readiness benchmarks for technical skills and workforce academic skills ("College Readiness Indicators," 2016; "Kentucky Department of Education: Career and Technical Education Resources," 2016). Instructional Supervisor 6's signifies the focus of the pK-12 public school districts in the Paducah micropolitan area by stating "Kids need to be able to read, write, and do basic math to be successful in the workforce…those are things when we look at college and career ready [these] are things kids are going to have to achieve to be productive in the workforce."

To ensure America has a capable workforce to compete in the global economy, students need to: learn how to communicate with people across the globe, have critical thinking skills that enable them to solve problems; and, be innovative by working with ideas rather than physical objects (Breslow, 2015; Rosefsky Saavedra & Opfer, 2012; Wagner, 2008). The data collected from the interviews of the instructional supervisors, representing eight pK-12 public school districts in the Paducah micropolitan area, suggests that ensuring graduates from secondary schools should be either college or career ready.

Achieve, Incorporated's research report *Creating a P-20 Continuum of Actionable Indicators of Student Readiness* (2013) found that it is crucial for public school systems to focus on national college entrance exam benchmarks. Similar to the Achieve, Inc. report, the systematic focus of secondary school graduates being either college or career ready aligns with Frizzell, Braun, Ferguson, Stark, & Kobe (2017) findings that preparing students for college and careers has gained wide acceptance in the United States among educators. However similar to Frizzell and colleagues (2017) additional findings, the interviews of the instructional supervisors suggests that the pK-12 public schools in the Paducah micropolitan area are not balancing the academic preparation required by Kentucky's public school accountability system with building essential career skills and abilities that the workforce interviewees suggest are missing in their employees.

Theme III: Need for Direct and Frequent Two-Way Communication Between pK-12 Public Schools and Local Industry on Specific Workforce Skills Needed in Paducah Micropolitan Area. Throughout the instructional supervisor and workforce interviews, the common theme of wanting to communicate in a meaningful way between educational professionals and business professions is evident. The research suggests that there are numerous

pathways that both educational professionals and industry leaders are using to communicate

(examples include field trips, serving on advisory committees twice a year for the area technical

schools; survey data by school districts of local business needs; and, working with the local

chamber of commerce); however, Theme II suggests that the communication is not leading to

ensuring perspective employees in the Paducah micropolitan area have the necessary skills

required of the global economy.

Instructional Supervisor 6 stated "one of the biggest things [industry] can do is

collaborate with school districts and let us know what it is that they are needing. Obviously, we

know the standards and the guidelines that the state sends down for us, but that may not be what

is important for [our local] workforce." From the instructional supervisors' perspectives, there is

a need for the local business and industry professionals to visit schools and classrooms to talk

with students about their workforce needs (Instructional Supervisor 4; Instructional Supervisor

8). In discussing the district's needs from the local business professionals, Instructional

Supervisor 3 stated "I think by making themselves available to schools in the district….You

know if it is just that they come in the building and go to the classroom and talk to students. Let

them know what it is they do, the skills that they need, the skills that they are looking for when

they hire somebody, and why that is important."

From the business professional viewpoint, the interviews suggest that the workforce

interviewees in charge of hiring and training new employees see the need for improved

collaboration and frequent communication with local pK-12 school districts. In discussing the

efforts to communicate with pK-12 schools, Workforce Interviewee 3 stated "[I am] not sure we

have done a great job of this….[But we] would like to build more local high school or

technical/vocational school relationships." In speaking to collaborating with local pK-12 school

systems, Workforce Interviewee 4 stated:

> "Today, most of the work we have done with the pK-12 systems has been just
>
> communication back-and-forth. We try to tell them what our needs are. They have tried
>
> to help us resolve those needs; but, as far as directly with them on a day-to-day basis or
>
> even a week to week or month to month; we have not done that yet. But we are anxious
>
> to [do so]."

The subtheme of needing to improve communication and collaborate with pK-12 schools was

evident in the coding of communication from businesses with pK-12 schools compared to

communication with business with postsecondary schools in the area. There were numerous

examples from the business leaders working with the local colleges and universities in the

Paducah micropolitan area (serving on advisory boards, attending the career fairs, and working

with specific departments to find employees). In comparison, there was only one mention of

actually partnering with a local pK-12 district which was not productive, "[Our company] tried

[working with a local] high school…, but we did not secure one hire" (Workforce Interviewee

3).

Finally, both pK-12 schools and business leaders see the importance of working together

to ensure they produce and retain a high quality workforce for the Paducah micropolitan area.

From the local business viewpoint, working with local secondary schools and postsecondary

schools is a focus to develop a talent pipeline to meet their workforce demands. "I find it to be

that we have to grow our own. That is the only way we are going to keep talent and avoid some

of the brain drain. You just [have] to keep those kids locally" (Workforce Interviewee 1).

Similarly, the pK-12 instructional supervisors see the need to develop and retain talent. "It is the

ones who are not going to leave here [that] we need to focus on. [Businesses] need to be inviting

those students in and talking to them about their expectations and training them as to those

expectations early on so we do not waste that time" (Instructional Supervisor 4).

Research from the Achieve, Inc. report, *Creating a P-2 Continuum of Actionable Academic

Indicators of Student Readiness* (2013), suggests that public schools in America need to ensure

that students graduate from secondary schools either college or career ready to insure successful

transitions into the next phase of their adult lives. The challenge that the local Paducah

micropolitan area, and ultimately America, faces is creating a P-20 system of education that

leads to students transitioning into the workforce with the necessary skills to respond to the

needs of the rapid evolving global economy (World Bank, 2010). However, Burrus and

colleagues (2013) found that the United States educational system has not adjusted at a rate to

keep up with the demand of the global economy because school systems do not respond as

quickly to economic demands as businesses respond. In 2014, Perna and Armijo concluded that

students are not transitioning to college or the workforce due to the lack of a P-20 approach to

education in the United States where there is collaboration between pK-12 educational systems,

postsecondary institutions, politicians, and business leaders to ensure students have the necessary

skills and knowledge to be successful in today's workforce.

In 2010, Donnor and Shockley concluded that America's success in the global market is

contingent on public schools preparing all students to help serve the interest of America's private

business sector. The American education system's ability to develop human capital in the form

of students entering the private sector with the skills, competencies, and attitudes are essential

drivers to the United States' economic growth (Goodman, Sands, & Coley, 2015). Research by

the Educational Testing System on the US Department of Labor's Occupational Informational

Network's database identified the five most important 21st century skills for America's workforce as problem solving, fluid intelligence, innovation, teamwork, and communication skills (Burrus et. al, 2013).

Across the United States, P-20 councils with representatives from educational stakeholders, politicians, and business leaders have been established to increase the communication to ensure America is producing the workforce that is necessary to compete in the global economy (Rippner, 2017). Research on state P-20 councils has shown little empirical data on the effectiveness of the collaboration efforts (Rippner, 2014). The qualitative research from this study suggests that both local pK-12 educational leaders and business leaders see the importance of communication and collaboration between each other to ensure that the local educational systems produce a talented workforce for local businesses. Unfortunately, the research also suggests that businesses and educational leaders are continuing to work within their own perspective silos. The 2012 report, *Preparing Every Citizen for the Knowledge Economy*, warned that the culture of each individual educational sector and business working within their own boundaries will fail to meet both the current and future economic needs of America.

CHAPTER V: DISCUSSION

The purpose of this study is to identify any difference between current workforce skill levels and employer expectations within the Paducah micropolitan area and to suggest steps that need to be implemented locally from the literature and research obtained to improve economic growth in the region. A mixed methods study was used by the researcher to understand this complex issue that allowed the researcher to collect both closed-ended data from the quantitative research phase and open-ended data from the qualitative research phase. Both the college and career readiness rates from 2013 through 2016 and the five-year cohort graduation rates from 2013 through 2016 of all the public pK-12 school districts in the state of Kentucky were obtained for the study. The researcher used an independent-samples t-test to analyze differences in college and career readiness rates and five-year graduation rates between the pK-12 public school districts in the Paducah micropolitan area and the rest of the pK-12 public school districts in the state of Kentucky.

For the qualitative portion of the mixed methods study, interviews were conducted. Eight of the 12 pK-12 public school district's instructional supervisors in the Paducah micropolitan area who are in charge of district-wide curriculum and assessment and four presidents or human resource directors from the largest employers in the Paducah micropolitan area who are in charge of hiring and training workers were interviewed. The interviews were transcribed, coded, and analyzed to determine the major themes between workforce preparedness and current workforce needs.

A convergent design model was used to merge both the quantitative and qualitative data analysis. Using both quantitative data and qualitative data provided different insight between

current workforce skill levels and employer expectations in the Paducah micropolitan area

(Creswell, 2013).

Summary of Findings

Research Question 1 investigated the actions secondary schools should take to meet the

Paducah micropolitan workforce needs. From the literature review conducted by the researcher,

The American Diploma Project called for state educational systems to use performance

indicators to drive all students toward college and career readiness and outlines both the cohort

graduation rate and the cohort college and career readiness rate as key performance indicators for

college readiness for pK-12 schools (Cohen, 2008).

From the qualitative research, Theme I: Lack of Alignment Between pK-12 Academic

Focus and Workforce Needs suggests that pK-12 public schools are extremely focused on the

state of Kentucky's accountability measures for academic outcomes of their graduates. These

academic indicators include testing on the Kentucky Core Academic Standards and the ACT

college entrance exam. The ACT college entrance exam, which is the main assessment used for

the college readiness rate in Kentucky, was emphasized as the major focus of all the instructional

supervisors who were interviewed.

Theme I from the qualitative research also suggests that the pK-12 public school districts

are not focused on teaching as assessing important workforce skills found from the literature

review. The Educational Testing System's report *Identifying the Most Important 21st Century*

Workforce Competencies: An Analysis of the Occupational Information Network [O*NET]

identified problem solving, fluid intelligence, innovation, communication, and teamwork as the

most essential workforce skills in the United States' economy (Burrus et. al, 2013). The

instructional supervisor interviews suggested that there is little intentional focus on teaching the

essential 21st century skills identified through analysis of the O*NET database by the pK-12

public schools in the Paducah micropolitan area. While the importance of the O*NET skills

were discussed by one instructional supervisor, there was no clear way to assess the skills. All

other instructional supervisors who were interviewed did not mention any of the essential

workforce skills that the analysis of the O*NET study identified as important performance

indicators that the school districts measure for its academic success. Thus, Theme I suggests that

the instructional supervisors of the pK-12 public school districts in the Paducah micropolitan

area have not adjusted their instructional strategies or made districtwide curriculum adjustments

to teach the essential workforce skills identified in from O*NET database.

Theme II: Need for Focus on Teaching Essential Employment Skills by pK-12 Public

Schools from the qualitative research conducted in this study suggests that new employees in the

Paducah micropolitan area lack four of the five essential skills identified from the O*NET

database. The interviews with presidents and human resource directors of four of the largest

employers in the Paducah micropolitan area suggest that problem solving is the skill that the

majority of their new employees lack. Lack of both written and verbal communication skills was

identified by the presidents or human resource directors.

Theme III: Need for Direct and Frequent Two-Way Communication Between pK-12

Public Schools and Local Industry on Specific Workforce Skills Needed in the Paducah

Micropolitan area suggests that both instructional supervisors and business and industry

professionals want to communicate with each other in a meaningful way to ensure prospective

employees have the essential workforce skills needed to be successful. There is evidence of

communication between pK-12 public schools and business and industry in the Paducah

micropolitan area; however, Theme II suggests that the present communication efforts do not

ensuring current new employees have the essential skills identified in the O*NET study (problem solving, fluid intelligence, innovation, communication, and teamwork). From the business professionals interviews, Theme III suggests that improved collaboration and frequent communication between pK-12 public schools and business and industry is needed.

Research Question 2 investigated the performance indicators necessary for high school graduates in the Paducah micropolitan area to successfully transition to college. Research by Achieve, Inc. (2013) determined that high school graduation rates do not serve as a leading indicator of college success for public schools. States and individual school districts should be focused on the percentage of their students who graduate college ready as identified by a national pre-college exam (Achieve, Inc., 2013). From the qualitative research in this study, Theme I suggests that pK-12 public school districts in the Paducah micropolitan area are focused on ensuring their students graduate either college or career ready. Ensuring that graduating students who want to go to college have met the ACT benchmarks to be college ready was stressed by all eight instructional supervisors who were interviewed. To better prepare students for the ACT, the instructional supervisors discussed the following curriculum or instructional adjustments: allotting extra time during the school day to prepare students for the ACT test; and, reallocating resources for one-on-one help for students who have not met the state of Kentucky required ACT benchmarks to be considered college ready.

Research Question 3 posed what are the essential skills needed to successfully transition into the Paducah micropolitan area's workforce. Burrus and colleagues (2013) analysis on the U.S. Department of Labor's O*NET workforce attributes concluded that there was a skill gap between college graduates' skills and 21st century workforce needs, and the essential skills of problem solving, fluid intelligence, innovation, communication, and teamwork were identified as

the most needed for the global economy. From the qualitative research in the study, Theme II

suggests that four of the five skills identified by the Burrus and colleagues (2013) analysis of the

O*NET database are missing in new employees in their companies. Analysis of the workforce

interviews in the study suggests that problem solving is the most needed skill that the majority of

new employees are missing. New employees lack the ability to use logic to think through and

solve a problem. In addition to problem solving, lack of communication skills, both written and

verbal, were found to be a major essential workforce skill that is lacking in new employees. The

need to use fluid intelligence to recognize patterns and see trends along with working as part of a

team were also identified through the workforce interviews.

Research Question 4 posed if there was a statistically significant difference in the

performance indicators (college and career readiness rates and graduation rates) needed for

successful transitions to college for the pK-12 public schools in the Paducah micropolitan area

compared to performance indicators for the rest of the pK-12 public schools in Kentucky. Using

the data obtained from the Kentucky Department of Education, both the four-year college and

career readiness rates and five-year cohort graduation rates for Kentucky were divided into two

groups: the pK-12 public schools in the Paducah micropolitan area into one group, and the

remaining pK-12 public schools in Kentucky into the second group.

Independent-sample t-tests were performed on both sets (college and career readiness

rates and graduation rates) for both the pK-12 public schools in the Paducah micropolitan area

and the remaining pK-12 public schools in Kentucky from 2013 through 2016. An independent-

samples t-test was performed to investigate the change from 2013 to 2016 in both four-year

college and career readiness rates and five-year cohort graduation rates for both groups.

Table 17 summarizes the significance calculated from the independent-sample t-test between college and career readiness rates of the pK-12 public school districts in the Paducah micropolitan areas and the remaining pK-12 schools in Kentucky.

Table 17

Significance of Four-Year College and Career Readiness Rates

	2013	2014	2015	2016	Four-Year Change
Significant , p	.031	.232	.483	.087	.538

Note. If p < .05, t-test for Equality of Means suggests there is a significant difference.

In analyzing the *Significance of Four-Year College and Career Readiness Rates* of the pK-12 public schools in the Paducah micropolitan compared to the remaining pK-12 public schools in the state of Kentucky, the researcher determined there was only a significant difference (p < .05) in the Equality of Means for the 2013 school year. For the 2014, 2015, 2016, and four-year change from 2013 to 2016, the researcher determined there was not a significant difference (p > .05) in the Equality of Means of the four-year college and career readiness rates.

Table 18 summarizes the significance calculated from the independent-sample t-test between five-year cohort graduation rates of the pK-12 public school districts in the Paducah micropolitan areas and the remaining pK-12 schools in Kentucky.

Table 18

Significance of Five-Year Cohort Graduation Rates

	2013	2014	2015	2016	Four-Year Change
Significant , p	.365	.378	.775	.036	.880

Note. If p < .05, t-test for Equality of Means suggests there is a significant difference.

In analyzing the *Significance of Five-Year Cohort Graduation Rates* of the pK-12 public schools in the Paducah micropolitan compared to the remaining pK-12 public schools in the state of Kentucky, the researcher determined there was only a significant difference (p < .05) in the

Equality of Means for the 2016 school year. For the 2013, 2014, 2015, and four-year change from 2013 to 2016, the researcher determined there was not a significant difference (p > .05) in the Equality of Means of the five-year cohort graduation rates.

Research Question 5 proposed what actions should pK-12 public schools implement to teach the essential skills needed by the Paducah micropolitan businesses. Theme I suggests that the pK-12 public school districts in the Paducah micropolitan area are focused on ensuring high school graduates meet Kentucky's benchmarks for the ACT to ensure the graduates are college ready. However, Frizzell, Braun, Ferguson, Stark, & Kobe (2017) concluded that in "addition to being academically prepared, students need opportunities to develop important skills and competencies" (p. 14).

Convergent Design Analysis. The quantitative findings of the study suggests that the Paducah micropolitan area's pK-12 school districts should be producing a workforce similar to the remaining pK-12 school districts in Kentucky. The independent-samples t-tests showed no significance between both the cohort college and career readiness rates and cohort graduation rates of the Paducah micropolitan area's pK-12 public schools when compared to the remaining pK-12 school districts in the state of Kentucky over the four-year period analyzed in the study. The first subtheme from Theme I of the qualitative research suggests that the pK-12 public schools in the Paducah micropolitan area are focused on Kentucky's state accountability system, which includes both college and career readiness rates and graduation rates. Based solely on the research from *The American Diploma Project* (2011), the quantitative data suggests that the graduates from the Paducah micropolitan area's pK-12 schools have the necessary skills to successfully transition to college and ultimately the workforce.

However, the qualitative portion of the mixed methods study suggests that those entering into the Paducah micropolitan area do not possess the necessary skills needed in today's global economy. The second subtheme of Theme I of the qualitative research suggests that the pK-12 school districts in the Paducah micropolitan area not focused on assessing the essential workforce skills identified by Burrus and colleagues (2013). Theme II from the qualitative findings of the study suggests that new hires in the Paducah micropolitan area lack four of the five essential workforce skills identified by Burrus and colleagues (2013): problem solving, communication skills, fluid intelligence, and teamwork. Thus, the researcher concluded that the lack of intentional focus on teaching and assessing the essential workforce skills by pK-12 public schools in the Paducah micropolitan area leads to the lack of these essential workforce skills being present in the employees in the Paducah micropolitan area.

Through the review of the literature, the economic necessity for ensuring pK-12 public school teach the essential skills to students to ensure America's success in the global economy is evident (Breslow, 2015; Burrus, et. al, 2013; Donnor & Shockley, 2010; Levy & Murnane, 2004, 2013; OECD, 2013; Rosefsky Saavedra & Opfer, 2012; Wagner, 2008). The need for America's schools to teach students differently than in the past to ensure they have the essential workforce skills to compete in the global economy requires a change in curriculum alignment, pedagogy, and assessment ("ATC21S," 2017; Breslow, 2015; Deeper Learning Strategic Plan Summary: Education Program, 2012; Frizzell et. al, 2017; OCED, 2012; Pellegrino & Hilton, 2012; Rosefsky Saavedra & Opfer, 2012 Wagner, 2008). Theme I from the study suggests that pK-12 public schools in the Paducah micropolitan area are not balancing academic preparedness with the essential workforce skills identified in the literature. Theme II strengthens the argument found in the literature locally for the Paducah micropolitan area. Theme III suggests that direct

and frequent two-way communication between pK-12 public schools and businesses in the Paducah micropolitan area is needed to ensure that the Paducah micropolitan area is producing the workforce that is needed to compete in the global economy.

Interpretations

The hypothesis of this study was that within the Paducah micropolitan area, there is a significant difference between current workforce skill levels and employer expectations. Through the literature review four points of emphasis emerged in regards to pK-12 public schools providing the United States' economy the workforce needed to compete in the global economy. The employment trends from January 2010 to January 2016 where 11.5 million of the 11.6 million, or ninety-nine percent, of the new jobs that were added employed people with at least some college education (Carnevale, Jayasundera, & Gulish,, 2016). This employment trends emphasized America's need for a college educated workforce in the global economy (Donner & Shockley, 2010; Goodman, Sands, & Coley, 2015; Levy & Murnane, 2013, 2014; Lockard & Wolf, 2012; "The White House," 2011; "Tough Choices or Tough Times," 2007; Uhalde & Strohl, 2006; U.S. Department of Education, 2012a; U.S. Department of Education, 2012b). Thus, it is important for every high school graduate to be college or career ready upon graduation to ensure a successful transition to college and the workforce (Achieve, Inc., 2013; Cohen, 2008; Donner & Shockley, 2010; Uhalde & Strohl, 2006; Wagner, 2008). Finally, the importance of teaching students 21st century skills, or essential employment skills, to ensure America has the workforce that needed to compete in the global economy (Burrus et. al, 2013; Donner & Shockley, 2010; Golden & Katz, 2008; Levy & Murnane, 2014; Schwab, 2015; Smink, 2007; Tucker, 2013; Wagner, 2008).

The results of the independent-samples t-test on both the four-year college and career

readiness rates and the five-year cohort graduation rates of the pK-12 public schools in the

Paducah micropolitan area as compared to the remaining pK-12 public schools in Kentucky

show no overall significant trends. In analyzing the *Significance of College and Career*

Readiness Rates (Table 17) between the pK-12 public schools in the Paducah micropolitan area

as compared the remaining pK-12 public school districts in Kentucky, the independent-sample t-

test did find significance in the 2013 school year. However, there was no significance in the

2014, 2015, or 2016 school years of the four-year change in college or career readiness. In

analyzing the *Significance of Cohort Graduation Rates* (Table 18) between the pK-12 public

schools in the Paducah micropolitan area as compared the remaining pK-12 public school

districts in Kentucky, the independent-sample t-test did find significance in the 2016 school year.

However, there was no significance in the 2013, 2014, or 2015 school years of the four-year

change in cohort graduation rates.

Coomes and Kornstein's (2010) report *Recent Economic Performance of Regions Around*

Kentucky suggested that Paducah's population is continuing to decline based on the slowest

economic growth of any metropolitan or micropolitan area in Kentucky. The *American Diploma*

Project (2013) report emphasized the importance of college and career readiness rates as the

leading indicator of college success, which in theory would create a capable local workforce

pipeline. The quantitative research in this study suggests that college and career readiness rates

of the Paducah micropolitan area are not significantly different from the other pK-12 public

schools in Kentucky. The researcher determined that the lack of high school graduates who are

college or career ready from the pK-12 public schools does not attribute to the lack of a capable

workforce in the Paducah micropolitan area, which could lead to slow economic growth found by Coomes and Kornstein (2010).

The World Bank report (2010) *Stepping Up Skills: For More Jobs and Higher Productivity* found that the challenge that America faces is to create a P-20 system of education that meets local and state workforce needs that respond to the needs of the rapidly evolving global economy. Achieve, Inc. (2013) report *Creating a P-20 Continuum of Actionable Academic Indicators of Student Readiness* suggested that there are two significant transitions in the P-20 continuum: pK-12 students graduating high school college or career ready; and, students leaving college with the necessary skills to obtain successful employment in the global economy. Based on the review of the literature, there is significant support of the need of high school students graduating college and career ready and employees having the essential employment skills needed in the global economy upon completion of college (Achieve, Inc., 2013; Burrus et. al, 2013; Cohen, 2008; Donner & Shockley, 2010; Golden & Katz, 2008; Levy & Murnane, 2014; Schwab, 2015; Smink, 2007; Tucker, 2013; Uhalde & Strohl, 2006; Wagner, 2008). However, the research suggest that pK-12 public schools need to focus on teaching all students the essential 21st century workforce skills throughout the pK-12 public education continuum in addition to ensuring students have the knowledge to meet the college readiness benchmarks or obtain career readiness industry standards upon high school graduation (Breslow, 2015; Rosefsky Saavedra & Opfer, 2012).

Through the mixed methods study, the researcher was able to determine an in depth understanding of the difference between current workforce skill levels and employer expectation in the Paducah micropolitan area. The quantitative findings of the study interpreted earlier in this chapter suggest that the Paducah micropolitan area should be producing a workforce similar

to the workforce being produced by other pK-12 school districts in the state of Kentucky. However, the Paducah micropolitan area still is experiencing a declining population and the slow economic growth (Coomes and Kornstein, 2010; "Population of Paducah," 2016; U.S. Census Bureau, 2016).

Theme 1 obtained from the interviews with pK-12 public school instructional supervisors in the Paducah micropolitan area clearly identifies that the public schools are solely focused on teaching to Kentucky's state accountability assessments. There is a significant and constant focus of the pK-12 public schools in the Paducah micropolitan area to teach and assess Kentucky's Core Academic Standards and assure students obtain college and career readiness standards upon graduation. Based on the literature review, the performance indicators that the pK-12 public schools in the Paducah micropolitan area are focused on are aligned with the P-20 continuum's identified academic indicators for college success (Achieve, Inc., 2013; Cohen, 2008; Donner & Shockley, 2010; Uhalde & Strohl, 2006; Wagner, 2008).

The interviews with the presidents or human resource directors of the Paducah micropolitan area identifies critical workforce skills that new hires are missing upon gaining employment. Theme II identifies that there is minimal intentional focus on teaching the essential 21st century workforce skills identified in the analysis of the United States Department of Labor's O*NET database (Burrus, et. al, 2013).

The qualitative findings outlined in Theme III suggest that improvement is needed in both direct and frequent two-way communication between pK-12 public schools and local industry on the specific workforce skills needed by the employers in the Paducah micropolitan area. There is evidence of communication between public school districts and industry in the Paducah micropolitan area, however, Theme II identifies that essential employment skills that

businesses and industry needs in new hires are lacking. This suggests that the communication between public schools and industry in the Paducah micropolitan area is ineffective.

The findings in this study suggests the lack of local P-20 alignment focused on providing a workforce for the 21st century. There is significant evidence that the pK-12 public schools are focused on the key academic indicators identified in the research for a P-20 learning continuum. There is additional evidence that the pK-12 public school districts in the Paducah micropolitan area focus is exclusively driven by Kentucky's state accountability system. However, the study suggests that pK-12 academic indicators for college success are not enough to provide a capable workforce for the Paducah micropolitan area for the 21st century economy. In addition to the academic indicators for college success, the research suggests that the pK-12 public schools in the Paducah micropolitan area should balance academic preparedness on state accountability assessments with teaching and assessing essential career skills and abilities identified in the review of the literature. This study found minimal evidence in the pK-12 public school districts in the Paducah micropolitan area have an intentional focus on teaching essential workforce skills identified by the review of the literature, and no evidence that the school districts have intentional focus on assessing 21st century skills.

The research obtained in this study suggests there is significant difference between current workforce skills levels and employer expectations identified by interviews with local workforce leaders. Both the quantitative and qualitative research in this study suggests the difference between workforce skill levels is not due to a lack of knowledge, but rather the lack of essential workforce skills required in the global economy that were identified by the review of the literature. America's public education system will not prepare students for the global marketplace by using the former educational structures and methods of the past (Smink, 2007).

To ensure alignment in educational outcomes between pK-12 public school districts and business and industry in the Paducah micropolitan area, the Paducah micropolitan area needs to implement a local P-20 communication process focused on improving communication and collaboration between public school districts and industry to ensure students obtain essential workforce skills prior to high school graduation. Establishing a local P-20 learning continuum will ensure students have both the knowledge and skills for a successful transition to the next phase of their lives; and thus, it will supply a more highly educated and trained workforce to meet the local demands to ensure Paducah has the opportunity to reverse the current economic and population trends it is experiencing (Coomes and Kornstein, 2010; "Population of Paducah," 2016; U.S. Census Bureau, 2016).

Practical Significance. The findings of this research study suggests that pK-12 public school districts need to evolve in order to meet the academic and workforce demands of the private sector in today's economy. The analysis of the recent workforce trends strongly suggest that workers in the American economy need some postsecondary training (Carnevale et. al, 2016). To ensure that pK-12 pubic school graduates have the prerequisite knowledge to successfully transition to college, students need to graduate either college or career ready (Achieve, Inc., 2013). However, research suggests that workers in the American economy also need to possess essential workforce skills: solve problems; have fluid intelligence; be innovative; be able to work as part of a team; and, to communicate effectively (Burrus, et. al, 2013). Thus, it is essential that pK-12 public schools develop these essential workforce skills in addition to ensuring students have the core academic knowledge measured on state accountability assessments (Goodman, Sands, & Coley, 2015).   As a superintendent of a pK-12 public school district within the Paducah micropolitan area, the researcher understands the challenge of

transforming public education in America to ensure that public schools meet the demands of the private sector. Research findings from this study suggest it is essential that public school districts focus on developing a local P-20 pipeline that effectively communicates with business and industry to ensure that students have the necessary knowledge and skills needed to transition seamlessly into the local workforce. To ensure students have the necessary foundational knowledge and essential workforce skills, public school district leaders must not lose sight that "skills beget skills" (Levy & Murnane, 2012, p. 22). Strong foundational skills in reading, writing, and mathematics must be mastered to ensure students can develop the higher-order skills of problem solving, fluid intelligence, innovation, teamwork, and communication (Burrus, et. al, 2013).

Research findings from this study suggest that public school district leaders must ensure that their school districts have an intentional focus on teaching and assessing the essential workforce skills needed by the private sector. To ensure that pK-12 public schools evolve to meet the private sector demands of the global economy without increasing their operational budgets, leaders within public school districts must focus on designing an educational learning continuum that incorporates effectively teaching 21st century skills by balancing academic preparation with educational experiences for students that build essential workforce skills (Frizzell, et. al, 2017). Research suggests that teaching 21st century skills is accomplished by making learning relevant to students to ensure that it resonates with them to increase motivation (Rosefsky Saavedra & Opfer, 2012). By making learning relevant, teachers will ensure students understand how learning specific knowledge and skills within a discipline fits into the broader picture through applying what students have learned. Teachers should focus on how learning

transcends disciplines by ensuring students have to creatively transfer knowledge from one discipline to other disciplines (Rosefsky Saavedra & Opfer, 2012).

Limitations

While this study yielded sound findings, as with most studies, limitations should be noted. First, the sample of this study cannot be generalized to other economic areas. For example, findings of a study of the urban graduation rates and college and career readiness rates of public schools in the Louisville, Kentucky-Indiana economic area may have different results compared to the state of Kentucky. The high percentage of private schools in the Louisville, Kentucky-Indiana area that are not required to report the school district's graduation rates and college and career readiness rates could skew the study. Secondly, the researcher bias as a superintendent of a public school within the Paducah micropolitan could skew the study. However, the attempt was made to minimize the researcher bias based on the researcher's administrative experience by utilizing a data coding method designed to minimize such bias. The third limitation of the study is that the graduation rates and college and career readiness rates of Massac, Illinois public schools, a portion of the Paducah micropolitan defined area, was excluded from the study. The exclusion of these data sets was due to the different graduation rate formula and different college and career readiness definitions for the Illinois Department of Education compared to the Kentucky Department of Education's graduation rate formula and college and career readiness definitions.

A fourth limitation of the study was the exclusion of the 2011 graduation rates and college and career readiness rates as proposed in the study. For the 2010-2011 school year the Kentucky Department of Education used the federal Average Freshman Graduation Rate [AFGR] which only provides an estimate of the percentage of students who graduated from

highs school on time. The AFGR formula uses aggregate data from a class of students enrolled

in a public school system by summing their eighth grade, ninth grade, and tenth grade year's

enrollments and then dividing by three. The number of total graduates at the end of the class's

fourth year of high school is then divided by the average of the three-year enrollment for their

eighth, ninth, and tenth grade years. Starting in the 2011-12 school year, the Kentucky

Department of Education started using a cohort graduation rate that was calculated by using

individual student record data to track each individual student in the class to determine an

accurate on-time graduation rate ("Dropout and Completion Rates in the United States: 2007 -

Defining the Averaged Freshman Graduation Rate for Public School Students Using the CCD,"

2017).

A fifth limitation of the study was the selection of the qualitative interviews of the

presidents and human resource directors who are in charge of hiring and developing workers

within their specific industries. Careful consideration was taken to obtain interviewees who

represented at least three of the five major workforce clusters within the Paducah micropolitan

area as defined by the Paducah Economic Development strategic plan ("Forward Paducah:

economic development strategy for Paducah," 2016). Interviews were conducted with presidents

or human resource directors from the following workforce clusters: health, professional services,

and river industries. However, the researcher was not able to conduct interviews with presidents

or human resource directors within the advanced manufacturing or creative industries workforce

clusters as defined by the Paducah Economic Development strategic plan ("Forward Paducah:

economic development strategy for Paducah," 2016). Workforce interviews were not conducted

with smaller employers within any of the five workforce clusters as defined by the Paducah

Economic Development strategic plan Kentucky ("Forward Paducah: economic development

strategy for Paducah," 2016). Information obtained from interviews with presidents or human resource directors from some of the largest employers within the advanced manufacturing and creative industries workforce may have affected the qualitative findings within the study. Interviews with presidents or human resource directors of small businesses in the Paducah micropolitan area may have altered the qualitative findings within the study. Information obtained from additional interviews with larger employers from advanced manufacturing and creative industries as well as small businesses may have altered the qualitative themes of the study.

The last limitation was subject reliability during the qualitative data collection portion of the study. Subject honesty and candor may be influenced by their experience in their current position or their working relationships with the researcher. For example, an instructional supervisor in the Paducah micropolitan area who is at the end of their career has a set of experiences that allow them to explain beliefs about district initiatives in a different manner than a less experienced person in the same position would express who may not be as comfortable sharing their district's beliefs and initiatives.

Research Recommendations

Based on the results of this study, there are a few recommendations for future consideration. *Identifying the most important 21st century workforce competencies: An analysis of the occupational information network* concluded that high school students needed to graduate college and career ready, and then students need to leave postsecondary institutions with the necessary essential skills to obtain employment and flourish in the current economy (Burrus, et. al, 2013). Thus, future researchers may decide may decide to evaluate essential workforce skills in local postsecondary graduates of the Paducah micropolitan area.

Throughout the literature, there is an emphasis on graduating high school either college or career ready as an academic indicator of a successful transition to college or the workforce. There is significant research in the literature of the success of students who graduate college ready and transition to college after high school. However, future researchers may want to investigate the essential O*NET workforce skills present in the high school graduates who are identified as career ready who enter the workforce directly after graduation.

Finally, future researchers may want to duplicate the design of this study to assess the presence of the five most critical skills (problem solving, fluid intelligence, innovation, communication, and teamwork) for workers in other economic regions in Kentucky or other states in America.

Conclusion

This study provides insight into the essential role that pk-12 public schools have in the development of the essential workforce skills needed for the Paducah micropolitan area. The quantitative results of the study failed to show any significance between the college and career readiness rates and graduation rates between the pK-12 public schools in the Paducah micropolitan area when compared to the remaining pK-12 schools in the state of Kentucky. However, the qualitative themes provided a complete understanding as to the essential workforce skills needed in the Paducah micropolitan area, and provided insight into local adjustments needed in curriculum, instruction, and assessments to meet local workforce needs. The challenge that the Paducah micropolitan area faces is similar to other small towns and rural communities across America. Through implementing a local P-20 system of education and communication between educators, business leaders, community leaders, and policymakers, the Paducah

micropolitan area can better meet local workforce needs that respond to the needs of the rapid

evolving global economy.

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Appendix A

Employer Recruitment Correspondence

Please accept this email as an invitation for an educational research study that I am conducting for an educational doctoral degree at Murray State University. You were randomly selected as a prospective participant in the study. I am providing the following information so that you may make an informed decision on whether you would like to participate in the research study. In the study, I am investigating if there is a gap between employers' expectations and the skill levels of their current employees in the Paducah micropolitan area. The purpose of the study is to guide the alignment of public pK-12 schools in the region to the workforce skill level needs in today's economy. Your participation is strictly voluntary and you are free to withdraw/stop participating at any time.

If you are interested in becoming a participant, you must meet the following requirements:

- You are responsible for interviewing job applicants

- You hire new applicants

All of your responses in the interview will remain anonymous, and I will use a pseudonym for you in the notes, transcripts, and manuscript. (No one will know which answers are yours.) All data collected in the interviews will be secured on a password protected computer owned by Paducah Independent Schools and assigned to Donald Shively. The interview will take approximately 1 hour to complete. There are no foreseen risks associated with your participation in this research study.

Attached to this email invitation is a consent form for your review. Please read the details carefully before deciding to participate in the interview.

Appendix B

Instructional Supervisor Recruitment Correspondence

Please accept this email as an invitation for an educational research study that I am conducting for an educational doctoral degree at Murray State University. You were randomly selected as a prospective participant in the study. I am providing the following information so that you may make an informed decision on whether you would like to participate in the research study. In the study, I am investigating if there is a gap between employers' expectations and the skill levels of their current employees in the Paducah micropolitan area. The purpose of the study is to guide the alignment of public pK-12 schools in the region to the workforce skill level needs in today's economy. Your participation is strictly voluntary and you are free to withdraw/stop participating at any time.

If you are interested in becoming a participant, you must meet the following requirement:

- You are responsible for district-wide curriculum

All of your responses in the interview will remain anonymous, and I will use a pseudonym for you in the notes, transcripts, and manuscript. (No one will know which answers are yours.) All data collected in the interviews will be secured on a password protected computer owned by Paducah Independent Schools and assigned to Donald Shively. The interview will take approximately 1 hour to complete. There are no foreseen risks associated with your participation in this research study.

Attached to this email invitation is a consent form for your review. Please read the details carefully before deciding to participate in the interview.

Appendix C

Research Participation Consent

Study Title: P-20 Alignment for Small Towns and Rural Communities
Primary Investigator: Donald I. Shively and Dr. Teresa Clark
Faculty Sponsor Contact: Dr. Teresa Clark, Educational Studies, Leadership, and Counseling
(270) 809-6956

You are being invited to participate in a research study conducted through Murray State University. This form contains information you will need to help you decide whether to be in this research study or not. You must be at least 18 years old to participate. Please read the form carefully and ask the study team member(s) questions about anything that is not clear. You will be given a copy of this form to keep.

1. **Nature and Purpose of Project:** This study investigates if there is a gap between employers' expectations and the skill levels of their current employees in the Paducah micropolitan area. The purpose of the study is to guide the alignment of public pK-12 schools in the region to the workforce skill levels needed in today's economy.

2. **Explanation of Procedures:** You are being asked to participate in an interview with the principal investigator who will use a pseudonym for you in their notes, transcripts, and manuscript. The interview may last up to 60 minutes (one hour). You may be contacted for a follow-up interview if questions arise after the initial interview.

3. **Recordings:** Each interview will be audiotaped and transcribed. You must agree to be audiotaped in order to participate in this research project.

4. **Discomforts and Risks:** Because all answers are being audiotaped and transcribed, there is a small chance that we could accidentally disclose information that identifies you. There are no other anticipated risks.

5. **Benefits:** This study is not designed to benefit you directly. However, your participation may help to increase our understanding of the research subject.

6. **Confidentiality:** It is possible that other people may learn that you participated in this study but the information you provide to the researcher(s) will be kept confidential to the extent permitted by law.

7. **Refusal/Withdrawal:** Your participation in this study is completely voluntary. You may refuse to participate, or you may stop participating at any time and for any reason, without penalty. If you would like to withdraw from the study, please contact Donald Shively, donald.shively@paducah.kyschools.us. If you choose to withdraw, the researcher will not use any data collected from your interview prior to your withdrawal.

8. **Contact Information:** Any questions about the procedures or conduct of this research should be brought to the attention of Donald Shively, researcher, donald.shively@paducah.kyschools.us or Dr. Teresa Clark, dissertation chair, tclark24@murraystate.edu.

Your signature indicates that this study has been explained to you, that your questions have been answered, and that you agree to take part in this study.

The dated approval stamp on this document indicates that this project has been reviewed and approved by the Murray State University Institutional Review Board (IRB) for the Protection of Human Subjects. Do not sign or agree to participate after the expiration date on the stamp. If you have any questions about your rights as a research participant, you should contact the MSU IRB Coordinator at (270) 809-2916 or msu.irb@murraystate.edu.

Participant's Name (printed): _____

_____ _____

 (Signature of Participant)   (Date)

_____ _____

(Signature of Person Obtaining Consent)   (Date)

MURRAY STATE
UNIVERSITY
Institutional Review Board
Approved: 4/24/17 Expires: 4/23/18