CHARACTERISTICS OF VIABLE AND SUSTAINABLE EMPLOYEES IN 2025

A Dissertation
Presented to
The Faculty of the Education Department
Carson-Newman University

In Partial Fulfillment
Of the
Requirements for the Degree
Doctor of Education
By
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March 2017
Dissertation Approval

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Title: Characteristics of Viable and Sustainable Employees in the Year 2025

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Abstract

The purpose of the study was to forecast desired characteristics of viable, sustainable workers in the Lakeway Area of upper East Tennessee for the year 2025. The study sought to identify the projected skills demands of the area workforce, the initiatives that successful companies will undertake in order to meet future employment demands, and the initiatives that successful public school entities will undertake in order to support the development of a viable, sustainable workforce. The study is a conceptual replication of a similar study by Brenda Dean (1999).

Twenty Lakeway Area business and industry leaders participated in a Delphi panel of experts. These leaders were purposefully selected from nominations submitted by leaders of Lakeway Area workforce organizations including Chambers of Commerce, Mayors’ Workforce Development Task Force, and the Tennessee College of Applied Technology. All major industry sectors and the largest employers of the Lakeway Area were represented in the panel of experts.

Round 1 of the study was qualitative in nature. In the first round the Delphi study, Delphi group members provided narrative responded to a survey comprised of 11 questions. These questions were designed to elicit feedback on experts’ perceptions about characteristics of the desirable employee in the year 2025 as well as initiatives of companies and schools will undertake to ensure the development of a qualified workforce. Responses to the Round 1 survey revealed emerging consensus, which informed the development of the Round 2 iteration. In Round 2, panelists utilized a Likert scale to indicate the level of importance of 55 characteristics and initiatives.

The results clearly indicated the need for a workforce characterized by a strong work ethic, personal integrity, dependability, and the ability to think critically in order to solve problems. Additionally, the Delphi panel indicated that strong, intentional partnership between school and industry will strengthen a community’s ability to provide a viable, sustainable workforce.
Acknowledgements

The road to any crowning achievement is paved with blessings from the Lord and the love and encouragement of many people. I am truly grateful for both.

I am eternally grateful for the love and support of my family. My passion for the education of children and the drive for continuous improvement were instilled in me by my mother and father, Gail and Tommy Pedigo, both of whom are servants at heart. My husband, Randy, and I share that passion today, and his support and encouragement through this journey has been invaluable. My love for my children, Madison and Noah, drives me to learn and do all that I can to ensure that they and their friends get the best education they can to prepare them for a bright future. I am grateful to be their mom.

For their guidance and assistance, I thank my illustrious dissertation committee, Dr. P. Mark Taylor, Dr. Brenda Dean, and Dr. Michael Sobiech. Their uncanny ability to know when to be push or pull, or when to be hands-on or hands-off, yet consistent in their positive reinforcement has been perfect. I am especially grateful to Dr. Taylor who regularly made sure I was on track and confident in my ability to make this happen.

My work “brothers and sisters” have been and continue to be a moving force in my life. Dr. David Freeman has been a vital, critical friend and sounding board, looking at every word, heading, and reference to make sure all is just right. Dr. Tony Dalton, Shanna McGinnis, Stephanie Dallmann, and Jill Fishburn remind me every day that the pursuit of teaching and learning can be hard, messy, unnerving, fun, fulfilling, and incredibly rewarding. I am grateful to them for being the absolute best and to Mr. Buddy Smith for encouraging us to be just that.
Finally, this work would not have been possible without the preceding work of Dr. Brenda Dean. Her vision for public education and solving its challenges is ingenious. I am forever grateful for her guidance, her influence, and her legacy.
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CHAPTER 1: INTRODUCTION

The post-World War II generation of American workers took great pride in the nation’s preeminent economic status. American ingenuity and work ethic drove an economy that saw a tremendous rise of invention and mass production. Over the next fifty years overseas competition and low-wage worker availability in other countries drained the U.S. economy of its manufacturing jobs, and the production basis of the American economy slowly shifted to a service base (U.S. Department of Labor, 1992). Today, the proliferation of technology and globalization in the twenty-first century workforce demands a new type of employee. Individuals with specified technical skills no longer fulfill the needs of the American workforce. The modern American workforce is marked by the need for technical skills, but also personal qualities and habits that make someone a good employee (Timm, 2005).

Today, utilization of technical skills in addition to skills such as teamwork, problem solving, and communication is a characteristic of a properly educated modern job candidate. Although the need for specific skills among workers is great, the research presented in this review shows that a prevalence of work candidates who possess these skills is lacking.

In 2007 America’s Promise and Educational Testing Service released a report warning America of a coming storm. This storm described is a result of a confluence of three things: a disparity in literacy and numeracy skills among current students and adult populations; a change in labor markets as a result of technology innovation, globalization, and a shift in balance between capital and labor; and sweeping demographic changes in the U.S. population. Forecasts showed that the labor force of the United States will grow more slowly from the years 2000 to 2020 than it did from 1980 to 2000. Further concerning, none of the growth predicted is expected to come from current citizens at the prime age for working (America’s Promise, 2007).
These three forces, when converged, changed the landscape of employability and opportunities for success among high school graduates. The report warned that upwards of tens of millions more American students and adults will be less able to qualify for higher-paying jobs. They will be competing not only with each other and millions of newly arrived immigrants but also with equally or better skilled workers in lower-wage economies around the world (Kirsch, 2007).

In addition to workforce changes, demographic changes are creating shifts in the necessary skills for successful, entry-level employees. As a result of ups and downs in birthrate over the last century, the population as well as the labor force will continue to diversify as a result of immigration. Projections suggested that the Hispanic and Asian shares of the population will rise from 14 percent in 1995 to 19 percent in 2020 (Lerman & Schmidt, 2009).

Statement of the Problem

Shifts in industry and employment needs require institutions, policy makers, governments, and citizens to think critically about the profile of a successful employee and systems to develop those employees. When a population of lower-skilled potential employees meets an industry landscape marked by the need of global thinkers, communicators, and problem-solvers, a skills gap is created. As stated in a publication by the U.S. Chamber of Commerce Foundation, “For the first time in our history, the American economy is creating more skilled job opportunities than there are well educated and prepared job applicants available” (Bridgeland, Milano, Rosenbalm & Civic, 2011, p. 7).

Understanding the future job market of the Lakeway Area is of critical importance to this six-county region in East Tennessee. Knowing the types of workers and their required skill sets will enable educational institutions and industrial entities to work together to ensure the
prevalence of viable, sustainable employees to meet the region’s future economic needs.

**Purpose of the Study**

The purpose of this study is three-fold:

1. To examine local employers’ perceptions of workforce readiness
2. To forecast what Lakeway Area employers identify as the skills necessary for successful, entry-level employment in the year 2025, and
3. Identify what role K-12 education can play in the preparation of successful employees.

**Research Questions**

The following research questions were formulated for this study:

1. What will be the competitive characteristics of a viable and sustainable worker in the year 2025?
2. What will successful companies do to ensure the availability of competent workers in the year 2025?
3. What changes in public education will be required to meet industry’s needs in the year 2025?

**Significance of the Study**

The economic well-being of a region depends on the well-being of its business and industry. Availability of a viable and sustainable workforce is key to maintaining a positive economic landscape. Public education plays a role in a region’s economics through preparation and skills-development of future workplace candidates. If public education is to effectively play this role, it is imperative that the school system understands what business and industry will require of future employees. Once these requirements are identified, strategies can be developed to meet these expected needs.
This study will provide important information to educational institutions and employment services of the Lakeway Area in Tennessee. This will allow the school system to take steps toward intentional skills development of students in order to prepare them for viable and sustainable employment upon graduation.

**Definition of Terms**

The following terms require definition for clarity in the context of this study:

*Lakeway Area.* This six-county region located in East Tennessee is comprised of the following counties: Cocke County, Grainger County, Greene County, Hamblen County, Hawkins County, and Jefferson County.

*Soft Skills.* Soft skills are those desirable qualities for a specific form of employment that do not depend on acquired content-based knowledge.

*Viable and Sustainable Employee.* A viable and sustainable employee is one who meets the minimum standard for initial employment and is able to perform satisfactory work and maintain employment.

**Limitations and Delimitations**

Limitations of the study include the following:

1) The members of the panel were chosen from the six-county Lakeway Area of upper East Tennessee.

2) The results reflect opinions and perceptions of panelists. No attempt is made to validate the stated opinions and perceptions.

3) The study is limited to the nature of the Delphi technique, allowing a group of participants to reach consensus without face-to-face interaction.
**Ethical Issues**

It is assumed that all respondents will answer all survey items with candor and to the best of their abilities.

**Organization of the Study**

Chapter One introduces the study, statement of the problem, purpose of the study, research questions, significance of the study, definition of terms, limitations and delimitations, ethical issues, and organization of the study.

Chapter Two contains a review of related literature and previous research related to the problem being studied.

Chapter Three explains the methodology of the study including procedures for gathering data and a description of the Delphi technique.

Chapter Four contains the procedures and results of the study, displaying information that was gathered from the research and consensus results that emerged from analysis.

Chapter Five contains a discussion of the results of the study including findings and recommendations for further study.
CHAPTER 2: LITERATURE REVIEW

This chapter provides a review of the literature and research related to this study. The review of the literature is divided into, (a) education and workforce needs alignment, (b) defining workforce readiness, (c) employers’ and candidates’ perceptions, (d) the evolution of soft skills, and (e) the role of K-12 in workforce readiness.

Education and Workforce Needs Alignment

In 2009, President Obama clearly articulated that the economic well-being of the United States is inextricably linked with the education attainment of Americans. In many states, education and workforce development largely function as separate entities. When this separation is present, the mission, values, and operations of the entities often conflict and, therefore, do not maximize their impact on the overall economic health of a state or region. Alford, Chasteen, and DeRosear (2006) asserted that states and regions could maximize their impact by aligning these policy areas into a single strategy they term “educonomy.” According to their research, understanding a region’s “educonomy” requires identification of business and industry talents and needs and understanding the current and emerging local workforce skills that are in demand. When these elements are aligned, educational institutions are able to develop and implement strategies to meet the needs of businesses and fill jobs that are available in the current workforce. The researchers reported that this alignment relies on a consistent and meaningful dialogue between education and economic/workforce development agencies.

Business and education leaders have engaged for some time in discussion around this type of skills alignment. The Business-Higher Education forum of Washington D.C. (2013) conducted research around the disconnect between education and the workforce and the role communication has played in creating the gap:
On the education side, the K-16 curriculum is generally not providing students who enter the workplace with a deep foundation in deeper learning capabilities. Similarly, the business community has generally failed to produce a nuanced articulation of its workforce needs, particularly with regard to the 21st century competencies of highest priority in different occupations and organizational levels. Moreover, how employers assess and train workers to be proficient in these competencies is equally opaque. (p.1)

Multiple studies were conducted to allow workforce entities to articulate skills deficits among those entering the contemporary workforce. The results of the studies discussed in this literature review revealed a sizeable gap in workforce readiness among graduates.

**Defining Workforce Readiness**

In response to the widening skills gap apparent among potential American workers, employers began to standardize their ideas of what defines the skilled worker of the new American workforce. Employers reported that employees need more, deeper skills sets including technical skills, employability skills, communication skills, and more sophisticated reading and writing abilities (Association for Career and Technical Education, 2008). Research by the American College Testing program (ACT) found that in 2006 highly paid workers required four years of high school English as well as skills taught in Algebra II. This indicated a connection between academic markers of those prepared for college and those ready for the workforce (Camara, 2013).

A 2006 study by a consortium of the Conference Board, Coorporative Voices for Working Families, the Partnership for 21st Century Skills, and the Society for Human Resource Management surveyed human resource professionals to determine the skills needed by successful post-graduation employees. The respondents identified oral and written
communication, professionalism, work ethic, and critical thinking/problem solving as most important for entry-level employment success (Casner-Lotto, 2006). Likewise, an additional study found a connection among workers’ literacy proficiencies and their ability to access the types of expert managerial knowledge required by high-skill jobs. While industry employers agreed that both technical skills and soft skills are necessary for successful entry-level employment, a perceived gap between those needs and the skills possessed by those entering the workplace remained (Kirsch & Braun, 2007).

Employers’ and Candidates’ Perceptions

In a study titled, *Across the Great Divide: Perspectives of CEOs and College Presidents on America’s Higher Education and Skills Gap*, Bridgeland, Milano, Rosenbalm & Civic (2011) found that 53% of leaders reported that their companies face distinct challenges in finding and recruiting non-managerial workers as a result of a gap between supply of qualified workers and demand. After identifying the top 10 skills deemed critical by business executives, a 2012 study by Robels concluded that a discrepancy exists between the interpersonal skills of current job applicants and the level of interpersonal skills required by employers. An additional challenge reported by employers is the changing educational requirements of job candidates. The California Post-Secondary Education Commission expressed its frustration in a 2006 report.

For years, economists and employers have said that the jobs in the future will require some kind of post-secondary education, and that a high school diploma will not be sufficient for the best jobs. Even for jobs without specific postsecondary requirements, they see new occupations that demand skills and knowledge beyond what the average high school graduate brings to the table -- even assuming all high school seniors graduate with a high quality education, which is far from the case (p. 3).
While employers’ perceptions indicated a clear skills gap among job candidates, students shared some of their perceptions about important employability skills, yet lacked understanding of others. Research from Clemson University indicated that both students and employers listed work ethic and teamwork among the most important employability skills of job candidates. However, employees also reported seeking candidates with strong analytical and technical skills, skills that were rated of lower importance by students (DuPre, 2011).

Similar research by Ju, Pacha, Moore, and Zhang (2014) sought to compare perceptions of employability skills among employers and educators. Alignment was found between employers’ and educators’ perceptions of the importance of being on time, showing respect, and honesty/integrity. However, educators ranked social skills and personal traits as important while employers ranked basic work skills and basic skills as important. Students indicated a need to align employers’, students’, and educators’ understandings and expectations around both the technical and soft skills that job candidates need in order to be successful in the workplace.

The Evolution of Soft Skills

Soft skills can be defined as desirable qualities for a specific form of employment that do not depend on acquired content-based knowledge. In 2012, Robels defined soft skills as character traits, attitudes, and behaviors rather than technical aptitude or knowledge. Sometimes known as key skills, core skills, key competencies, or employability skills, soft skills are those that apply across a variety of jobs and life situations (Karthikeyan & Baskaran, 2011). Robels’s (2012) study of 90 business executives yielded a list of 517 skills, with repetition, identified as important new employee skills. The list was then codified by theme to yield the top 10 most mentioned soft skills including integrity, communication, courtesy, responsibility, social skills, positive attitude, professionalism, flexibility, teamwork, and work ethic with integrity and
communication listed as the top two skills. A study by Idrus, Dahan, and Abdullah (2014) included critical thinking and problem solving, information management, and entrepreneurship in the list of soft skills considered important by business leaders.

**The History of Soft Skills**

The idea of soft skills has evolved over time. The earliest references to soft skills appeared in military training documents by Fry and Whitmore in 1972. Success in the military involved more than tactical skills in battle and incorporated service skills, teamwork, and the ability to inspire confidence in others. In a 1972 field manual, the U.S. Army defined soft skills as those involving primarily people and paper including troop inspection and supervision of personnel (Fry & Whitmore, 1972). Soft skills, as discussed by Fry and Whitmore, are still cited as common competencies among veterans (Frame, n.d.).

Katz (1975) placed the skills required for entry-level managers into three categories: technical, human, and conceptual. Though technical skills were specific to the operation of the business, human skills referred to those involving the management of people. Conceptual skills involved in establishing a vision for the business included decision-making and forecasting. These human and conceptual skills would later become known as soft skills.

Near the turn of the second millennium, soft skills became more predominant in the discussion of traits desired by employees and, therefore, more specific to the needs of the new American workplace. Conrad (1999) revealed that professionalism, thinking, and cognitive skills appeared on lists of desirable traits of potential employees. These traits were affirmed in 2010, when the Conference Board, Corporate Voices for Working Families, the Partnership for 21st Century Skills, and the Society for Human Resource Management conducted an in-depth study of the corporate perspective on the readiness of new entrants into the U.S. workforce. The
survey of over 400 U.S. employers noted professionalism, communication, collaboration, and critical thinking among the most important skills cited by employers. The study went on to state that the 2010 workforce was “woefully ill-prepared for the demands of today’s and tomorrow’s workforce” (Casner-Lotto, Barrington & Partnership for 21st Century Skills, 1996, p.9).

The Institute for the Future of the University of Phoenix Research Institute (2011) used the Delphi technique among Fortune 500 companies, government agencies, and foundations to forecast the disruptive forces anticipated in the workforce in the near future and what skills would allow workers to overcome those forces. The study yielded a list of ten skills including sense-making, adaptive thinking, social intelligence, design mindset, media literacy, virtual collaboration, cross cultural competency, cognitive load management, and computational thinking. This institute’s forecast of desirable job skills reflected the polarization of growth in the United States of high-skills and low-skill jobs, both of which required a capacity for novel thinking.

**The Soft Skills Imperative**

Several studies have revealed the importance of well-developed soft skills among candidates for employment. Research by Wilhelm (2004) found that employers actively sought employees who were socially well adjusted and mature. Those employers rated soft skills as number one in terms of importance for success at an entry-level job. LaFrance (2009) stated that soft skills are appealing to employers “across the board” and play a larger role in finding and maintaining employment than hard skills. Research by Klaus (2010) revealed that 75% of long-term job success depends on people skills, with only 25% dependent on technical knowledge. However, employers reported having a hard time finding candidates with these necessary non-
cognitive traits. A survey of 400 leading American corporate managers indicated that 70% of high school graduates lack professionalism and work ethic skills (Bronson, 2007).

The Soft Skills Gap Among Graduates

Though research showed that soft skills are considered vital to employability, employers reported a perceived gap between academic output and industrial requirement that can be addressed through better development of soft skills (Kahlon, 2013). A 2014 study revealed that a large percentage of students who face entry to the workforce before 2027 significantly lack in soft skills development (Duckworth, 2014). Students did, however, report that soft skills instruction can have a positive effect on graduate employment readiness. A study by Greenburg (2014) found that 80% of executives believe that integrating the Three Rs (reading, writing, and arithmetic) and the Four C’s (collaboration, communication, creativity, and critical thinking) would ensure that students are better prepared to enter the workforce. Since soft skills are so critical to the success of graduates, employers reported a belief that it is imperative that soft skills education be integrated into future classroom teaching (Kahlon, 2013).

Soft Skills and College Readiness

In addition to post-high school workforce readiness, research has shown that well-developed soft skills also benefited those entering college prior to the workforce. Adams (2012) reported that those who successfully transitioned from high school to college showed an ability to manage their own time, get along with roommates, and deal with setbacks. Harris and Rogers (2008) conducted a study of engineering and engineering technology professors of South Carolina State University, Clemson University, and Purdue University, as well as Project Lead The Way (PLTW) affiliate professors. Professors indicated that students’ interpersonal and communication skills as well as work ethic as desired attributes in students entering their
respective programs. In an effort to better prepare students for success, many schools began incorporating non-cognitive, soft skills education into their college and career readiness efforts (Adams, 2012).

Content skills are measured by standardized college readiness assessments like ACT and SAT. While these content knowledge skills were important to college success, college-going students maximized their chance at success by honing the skills that enhanced the way they approached their work and interacted with others (Sloane, 2014).

The Role of K-12 in Workforce Readiness

The preparation of graduates for the workforce begins long before a student’s graduation date. The imperative to prepare students for a changing workforce has become a goal in the forefront of schools responding to a recent push to make students college and career ready. As Deans and Robinson (2015) stated, “Schools must provide experiences that deepen their understanding of these careers throughout high school so that, by graduation, students have the knowledge and skills to pursue the opportunities that matter to them” (p. 7). The research discussed in this section suggests certain programs and practices among schools showed a positive effect in career preparation among graduates.

A 2012 study conducted by ACT followed the practices of 63 schools the researchers deemed to be advancing students more quickly toward college and career readiness. The study found that teachers from higher performing high schools reported supportive and orderly learning environments and a clear academic focus as attributing to student college and career readiness. Schools with atypically fast rates of advancing students toward college and career readiness reported having clear and high expectations for students, maximization of instructional time, and high-fidelity use of instructional tools and strategies (ACT, 2012). A 2007 issue brief
by America’s Promise examined student response data of 15-17 year old students regarding the connection between career awareness and school opportunities. Authors of this study suggested that in order for students to build the skills needed for employment, activities and work in schools must reflect real-world situation and align to the needs of the workplace (America’s Promise, 2007).

**Career and Technical Education**

One traditional K-12 program that seeks to offer students insight into workplace readiness as well as pathways to launch careers is the Career and Technical Education (CTE) program. CTE programs play a critical role in the growth of workforce readiness by giving students access to workplace conditions, teaching them to apply skills, and connecting them to business and industry. One way in which CTE programs have sought to close the skills gap is through the process of assisting students in gaining workplace credentials. Teachers of career and technical education courses use the workforce readiness credentialing systems to align curriculum and prepare students for both future study and workforce entry (Hyslop, 2008).

The Association for Career and Technical Education (2008) reported that employers find that the granting of formal credentials typically created under federal legislation better prepares students for the workplace. Further, they find that these programs provide clear links to the workforce for students. Additionally, CTE programs have provided business leaders opportunities to interact directly with K-12 schools. Seventy-five percent of CTE teachers stated that business and industry leaders have served on program advisory committees for their courses, 60% said the business and industry leaders visited their classrooms, and 29% said the leaders validated the standards of the course work (ACTE, 2008).
Postsecondary Skills Education

As educators continue to open lines of dialog with the college and career arenas, soft skills have become a vital part of the conversation (Robels, 2012). Soft skills have been identified as successful traits among those entering college and career. Therefore, K-12 school settings have been tasked with integrating soft skills education into classroom instruction. Much of what constitutes well-developed soft skills occurs through socialization. When students reach postsecondary educational levels, they have been socialized to a large extent (Nunn, 2013). According to Harris (2008), these skills should be introduced and integrated at an early age. Robels (2012) asserted that even in quantitative subject areas, teachers must instill the importance of soft skills in addition to content knowledge.

There are multiple approaches to soft skills integration into traditional education. Evenson (1999) reported that there are four essential steps to soft skills curriculum integration. First, students are introduced to basic people skills. Next, teachers segue into essential service skills. Third, teachers foster student understanding by facilitating a problem-solving discussion based on real-life situations. In the final step, students demonstrate the newly acquired skills in role-play situations. The U.S. Department of Labor (2006) favored a more authentic approach. In 2006, the Department’s Office of Disability Employment Policy released a guiding document on the integration of soft skills education into classroom instruction. The Department identified three common methods for experiential learning of soft skills. The first, interactive teaching, involved skilled instructors presenting a well designed, spiral soft skills curriculum involving students in mock situations calling for soft skills. The second utilized a coach in an authentic on-the-job experience. The third and most successful approach was to alter aspects of the classroom setting to simulate aspects of the workplace. This method was found to be the most authentic
approach with minimal cost and effort on the part of the school.

In addition to formal soft skills curricula, research showed that schools can alter the policies and procedures with the context of traditional instruction to encourage the development of soft skills. Multiple researchers reported ways that schools can support skills development through instruction. Adams (2012) suggested that teachers could give students longer, more rigorous assignments that require research and group work in order to develop a broader set of strategies. By making elements of the syllabus or learning objectives a critical part of the instructional process, teachers encouraged students to set goals for learning and for developing a sense of purpose (Kahlon, 2013). By requiring students to meet a high standard of excellence in written assignments, teachers encouraged good communication skills (Harris & Rogers 2008). Cooperative learning strategies were successful at developing collaboration skills among students when integrated as a way of fostering learning rather than as a subject to be taught (Greenburg, 2014). When students were regularly exposed to influential adults in the learning environment who demonstrated these skills, they not only understood the value of soft skills, but they knew how and when they applied to real-life situations (LaFrance, 2009).

Research also showed that the integration of soft skills education in K-12 classrooms enhances opportunities for success in the K-12 classrooms themselves. According to a 3-year longitudinal study by Layton (2014) for the American Education Research Association, incorporating socialization techniques including the development of soft skills into the elementary instruction led to higher academic achievement. This need was particularly apparent in the current generation of students given that second millennial generations were often characterized as having lax communication and social skills (Duckworth, 2014).

Studies showed that students with strong soft skills in the K-12 classroom were more
reflective and self-directed (Karthikeyan & Baskaran, 2011). Another study by the Department of Labor (1999) indicated a connection between responsibility and honesty and reading, writing, and problem solving. In addition to classroom success, the Collaborative for Academic, Social, and Emotional Learning charged Durlak with performing a trio of meta-analyses that indicated that targeted soft skills programs in schools were successful at enhancing students’ academic and social-emotional skills (Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011).

**Impact on Curriculum and Instruction**

In response to the imperative to produce a better-prepared workforce, the National Governor’s Association and the Council of Chief State School Officers launched its Common Core State Standards (CCSS) initiative in 2009. Following the launch of the CCSS, 45 states and the District of Columbia adopted the standards. At the heart of the standards was the idea that students would graduate high school being college and career ready. The standards were designed to define the knowledge and skills students should achieve in order to graduate from high school ready to succeed in entry-level, credit-bearing academic college courses and in workforce training programs (Conley, Drummond, Gonzalez, Rooseboom, & Stout, 2011). The launch of the standards had an impact on teacher preparation, education policy, curriculum, assessment, and accountability in the United States (Kyllonen, 2012).

Large-scale assessments are beginning to integrate college and career ready skills. The Programme for International Student Assessment (PISA) test given by the Organisation for Economic Cooperation and Development now includes collaborative problem solving. PISA is a test often referenced when comparing educational aptitude of students in various countries (Hu, 2015). Proponents of more competency-driven standards and assessment have expressed hope that such changes will empower students, teachers, parents, and schools to make data-based
curricular and instructional decisions that drive students toward future success.

**Conclusion**

Employers have articulated the need for a better-prepared workforce, one that is strong in both technical and non-cognitive, or soft skills. Research showed a disconnect between the skill set of current graduates and those necessary for successful entry into America’s changing workforce. Changing demographics, changing economic needs, and an emergence of new technology reveal a change in the makeup of a quality job applicant in the new American workforce. The nation’s economy depends upon a nation’s ability to hire a competent workforce. The literature clearly establishes that a skills gap exists between the type of worker needed and the skill sets of job applicants.
Chapter 3: METHODS AND PROCEDURES

This chapter includes a description of the research design, participants and setting of the study, description of the instrument, research procedures, procedure for data analysis, limitations and delimitations, and ethical issues.

Research Design

This project utilizes a mixed method approach. The Delphi method is a research technique that utilizes a group of experts who anonymously respond to questionnaires and receive subsequent feedback regarding the “group response” after which the process is repeated (Rand Corporation, 2016). The Delphi technique was used to determine regional workforce leaders’ perceptions of the characteristics of the viable and sustainable employee in the year 2025. The study is replicative in nature. Dean (1999) conducted the same study in order to determine the characteristics of viable and sustainable employees in the year 2015. The results of the study informed the integration of soft skills curriculum in Hamblen County schools as well as the formation of a joint panel on workforce readiness among Hamblen County instructional leaders and local workforce leaders. The study seeks only to observe facts and analyses to determine correlation among respondents and does not seek to find causation.

The Delphi technique was used to forecast the characteristics of the viable and sustainable employee in the year 2025 in the six-county region of upper East Tennessee known as the Lakeway Area. The Delphi technique was developed by the Rand Corporation in the early 1950s. The method operates on the assumption that \( n \) heads are better than one. The purpose of a Delphi study is to gather the perspectives and opinions of a panel of experts using a controlled communication system (Wellington & Szczерbinski, 2007).
The Delphi technique is used specifically to develop a consensus among members of a panel of experts using anonymous discussion among a carefully selected panel using questionnaires and controlled feedback. The structure of the process increased the likelihood that the results were a result of good decision making while preventing groupthink (MindTools, 2017). The study included administration of two rounds of questionnaires to each member of the expert panel. At the conclusion of each round, feedback was provided to the panel. Panelists were given the opportunity to reflect on their previous responses in light of the given feedback. This process continued until consensus was reached. Round one consisted of open-ended questions. Following the administration of round one, the qualitative responses were analyzed and coded for like responses and repeated concepts. Those responses informed the Likert-type, quantitative questionnaire that was administered in round two. Responses from round two were analyzed using quantitative statistical analysis, ranking the responses in order of importance indicated by the participants’ responses.

**Participants and Setting for the Study**

The study was conducted among leaders of business and industry in the Lakeway Area of upper East Tennessee. Youssef states that group members should be identified and selected with care in order to insure that “all various publics or positions are proportionately sampled” (2007). For the purposes of this study, various publics or positions was defined as leaders representative of the largest employers in the Lakeway Area, representative of multiple counties, and representative of the various sectors of industry and business most prevalent in the Lakeway Area. The researcher utilized a purposeful sampling approach when assembling the panel of experts. The researcher first contacted generalists familiar with the workforce landscape of the Lakeway Area to request nominations. Those individuals were asked to nominate those who
represented employment leaders in their respective counties in the major industry sectors of the region. Nominations were then categorized and culled to ensure proportional representation reflective of the workforce of the area.

Once the panel was selected, a personal electronic correspondence was sent to each nominee explaining the purpose of the study, the need for expert input, and requesting their participation. In order to reiterate credibility and importance of the survey, community leaders including a county mayor, a Career Technical Supervisor, two Chamber of Commerce employees, and a city councilmember sent correspondence to nominees in support of the study. Nominees then confirmed their willingness to participate signaling agreement and acceptance of the informed consent statement via online survey.

Those selected to participate in the study met the four attributes required of effective participants in a Delphi as defined by Delbecq, Van de Ven, and Gustafson (1975, p. 87):

1) Feel personally involved in the problem of concern to the decision-makers

2) Have pertinent information to share

3) Are motivated to schedule the time needed for the Delphi in their completing tasks and

4) Feel that the aggregate judgment of the respondent panel will include information that they will value and to which they would not otherwise have access

The specialized employment needs of the Lakeway Area meant that the study was unique to the specified setting. For this reason, the Delphi method was most appropriate since it allowed the researcher to gather responses from those who best understand the setting and issue (Skulmoski, Hartman, & Krahn, 2007). The small number of panel members allowed each
member to spend more time responding to the questionnaires, another noted strength of the Delphi procedure (Adler & Ziglio, 1996).

**Description of the Instrument**

The first iteration called for panel participants to respond to 11 broad questions in narrative form. Utilization of open-response questions encouraged participants to provide comprehensive answers. These same questions were first administered to participants of the 1999 study by Dean and were kept for this study in order to determine historical context and if panel member perceptions have changed over time. In addition to questions related to the content of the study, biographical and contact information was requested of each participant. The purpose of these questions was to allow the researcher to illustrate the panel’s expertise.

The purpose of the second iteration of the survey was to establish stronger consensus on the concepts that emerged most frequently in the first iteration. The second questionnaire utilized the responses from the first questionnaire in order to reformat the questions in a way that asked participants to scale the ideas of the group using a 5-point Likert scale, a quantitative selection scale. The scale asked participants to rank workforce readiness characteristics, proposed pursuits of business and industry, and purposed pursuits of education entities as critical, considerably significant, of some importance, of little importance, or not important.

One disadvantage of the Delphi technique is the amount of time it takes for all participants to respond to the questionnaire (Adler & Ziglio, 1996). Following administration of round one, there was a time lapse before administering round two. The use of online consent and online questionnaires kept the process of this study timely, compensating for anticipated time lapse. As results were submitted online, the answers were logged into an Excel workbook, storing participant responses separate from the software that identified participants by name.
Therefore, names and corresponding responses were kept separate allowing for single respondent anonymity (Protection of Human Subjects, 2009).

Data Analysis

In a Delphi process, data is analyzed both qualitatively and quantitatively. After receiving responses to the first round questionnaire, an analysis of responses was performed in order to create the second questionnaire. The researcher analyzed and codified responses in order to ascertain where similar ideas among panelists existed. Exact duplicate answers were removed and terminology was unified. The researcher began by analyzing qualitative responses in the narrative iterations of the round one questionnaire.

In round two, responses were weighted according to the level of importance indicated by the responses. In order to assign a value to the experts’ responses, each of these characteristic was assigned a number value based on how important it was ranked. A response received 5 points for being ranked as critical, 4 points for being ranked considerably significant, 3 points for being ranked of some importance, and so on. The total each characteristic received across the entire panel was calculated to provide a single number. The average rating of the total score for each characteristic allowed the researcher to rank the responses. In this manner, an importance value could be assigned to each answer. Therefore, the researcher could determine which characteristics and proposed pursuits were considered to be of greatest to least importance according to the panel.

Summary

Chapter 3 describes the methodology and procedures used to gather data for the Delphi technique study. The description of the research design, the selection of the Delphi panel of experts, the design of the instruments and the procedure for data provided a foundation for
research to continue. Chapter 4 of the study includes the results and analysis of responses to the instruments.
Chapter 4: RESULTS

This chapter contains a summary of the procedures and results of Round 1 and Round 2 reports the results emerging from the Round 1 and Round 2 Delphi. The purpose of the study was to attempt to forecast the characteristics of a viable and sustainable entry-level employee in the year 2025. In an effort to collect and synthesize the perception of workforce leaders of the Lakeway Area, a Delphi panel was formed. The panel consisted of leaders of six of the top 20 employers of Hamblen County, the largest employer of Hawkins County, an industrial employment leader from Grainger County, Chairman of the Hamblen County Mayors’ Taskforce on Workforce Development, City of Morristown Vice-Mayor, President of the Hamblen County Chamber of Commerce, and various Lakeway Area employment specialists. Panelists represent leadership in all major employment sectors in the Lakeway Area including education; manufacturing including automotive, chemical, and general manufacturing; and healthcare. The purpose of the instruments and analysis was to determine the panel’s answers to the three research questions:

1. What will be the competitive characteristics of a viable and sustainable worker in the year 2025?

2. What will successful companies do to ensure the availability of competent workers in the year 2025?

3. What changes in public education will be required to meet industry’s needs in the year 2025?
Often future tense is used when reporting the responses of the panel of experts. The use of this tense does not indicate a prediction or certainty that the event will happen. Rather, it is the perception of the expert panel that the event will occur.

**Selection of Participants**

Participants were purposefully selected through a nomination process. Nominations were solicited from area Chamber of Commerce Presidents, the Lakeway Area LEAP grant coordinator, the Hamblen County Mayor, and the City of Morristown Vice-Mayor. After nominees were culled for proportional representation for purposes of the study, nominees were contacted via electronic mail to solicit participation. Of the 25 original nominees, 20 nominees responded, and 18 provided complete participation. Each of these 18 participated in both rounds of the survey in a timely manner. All identifying information was removed from responses.

**Instrumentation**

The Round 1 questionnaire was designed to elicit discussion from participants about workforce readiness characteristics and initiatives that would assist employers in finding viable, sustainable employees. The Round 2 questionnaire was designed based on the responses from Round 1 and sought to develop consensus among participants about which characteristics and initiatives would be most beneficial. Both questionnaires were created using the online tool, Survey Monkey. The first questionnaire contained eleven open-ended response questions reflective of the research questions. Responses from the first questionnaire were coded and consolidated in order to clarify perceptions. This analysis provided indications of consensus among panelists, leading to the second questionnaire. A link to the second questionnaire was sent to participants individually asking them to indicate to what degree of importance they would assign each characteristic or proposed pursuit.
Round 1: A Qualitative Approach

The researcher initially read each response to the first questionnaire without any content analysis. During the process of content analysis, questions were considered individually. The researcher read all responses to question #1 to discover common themes among participants’ responses. The same process was repeated with each of the remaining questions. The researcher combined like responses into common categories. However, responses that were not repeated by any other panelists were considered outliers. The researcher recorded the number of times panelists mentioned a characteristic or pursuit. Those responses that had the highest number of mentions indicated growing consensus among panel experts. These responses were used as the basis of questions formulated for the second questionnaire.

Round 1 Results and Analysis

Panelists provided valuable information about industry needs for employees in the year 2025. The information gleaned from each question has been organized in order to provide clarity and insight. The names and organizations of panel members are not listed in the findings and analysis as presented in the informed consent agreement. However, a list of panel members is provided in the Appendix.

Survey question 1: In your judgment, what are the three most important general worker characteristics employers will seek in employees in 2025?

Two characteristics emerged as being most important to employers when describing the ideal employee of 2025. Those characteristics were a strong work ethic and an ability to use and adapt to technology. A large portion of respondents mentioned the need for a strong work ethic among employees. Respondents described this work ethic as a “willingness to work for a living and to put forth effort.” Mentioned as often as work ethic was the need for employees to be
technologically savvy. Panelists described employees as needing to be able to adapt and adjust to new technologies and use technology to solve problems in innovative ways.

Survey question 2: In your opinion, what will be the three most important characteristics or skills that successful workers in 2025 will possess in the following areas? Interpersonal, technology, thinking, mathematical, communication, organization, physical

In terms of interpersonal skills, survey participants most frequently responded that the ability to work in teams was of utmost importance. This characteristic received twice the number of responses as the next most mentioned characteristic, verbal communication. The most frequently mentioned technology skill for a future successful worker was the ability to use Microsoft Excel, followed by the ability to adapt to new and emerging technology. In the area of thinking skills, respondents mentioned three skills equally with the most frequency: analysis, decision-making, and problem solving. In mathematics skills, survey participants mentioned knowledge of basic math facts most frequently. In the area of communication, participants mentioned the need for presentation skills as most important for new employees followed closely by listening skills. In terms of organization, participants most frequently mentioned time management as the most important skill. Finally, in the area of physical skill, participants mentioned general well-being and stamina as most important and of equal importance.

Survey question 3: What do you believe are the three most important initiatives currently being undertaken by industry to ensure that an ample supply of skilled workers will be available in 2025?

There was a high degree of consensus by the Delphi group in response to this question. Two programs emerged as the most frequently mentioned: partnerships with local school districts and internships for students. Participants mentioned continuing efforts such as the
Lakeway Area Leveraging Educational Assistance Partnership (LEAP) grant and workforce diploma as partnership opportunities they foresee as a viable initiative. The LEAP grant was awarded to Lakeway Area schools in 2014 in order to strengthen school and industry connections through alignment of technical programs and equipment as well as teacher externship opportunities.

Internships, which allow prospective employees to receive hands-on training prior to employment were mentioned second most frequently. One participant specifically noted the importance of working with local industry/school grant organizations in order to “make sure that kids are ready for school and to graduate.” Another participant mentioned that industry should offer students “more opportunities to tour industry and learn about technical jobs.”

Survey question 4: What three initiatives by business and industry do you believe will be most successful in attracting and maintaining quality, skilled employees in the year 2025?

Responses to this question also indicated a high degree of consensus among the Delphi participants. When asked about future industry initiatives to attract and maintain quality workers, three initiatives emerged as most frequently mentioned. The need to provide better benefits was mentioned with most frequency. Some panelists listed insurance coverage as a specific benefit to attract and maintain workers of the future. One panelist specified “quality of life” benefits as being especially important. Both advancement opportunities and competitive pay emerged as the second most important mentioned future industry initiatives. Some panelists specified the need for pay to be related to skill level in order for jobs to be attractive to sustainable employees.

Survey Question 5: As you consider the work experience and educational training required for employment in the year 2025, what three major changes do you foresee in such
programs as apprenticeships, on-the-job training, on-site training, or work experience requirements?

In terms of major changes to work experiences in the future, participants foresaw an expansion of apprenticeships and the need for increased internal company training as viable initiatives. Apprenticeships offer future employees the ability to practice in the actual work environment, most often with the understanding that successful completion of this practice will result in job placement. One participant suggested that these apprenticeship opportunities should “start at a younger age” while students are still engaged in classes and communication pipelines exist with school agencies. While one panelist suggested that soft skills could be taught at the K-12 level, the participant indicated that, “we can train them on the hard skills through apprenticeships and on-the-job training.”

Internal or on-the-job training was also forecast to expand in future industry. Panelists indicated that this could be because of a growing mismatch between skill demands and skills of the workforce. As one participant stated, “Skilled labor jobs such as electricians will most likely have to be trained internally due to a shrinking base to pull from. Many skills (like printing press operation) are not being taught as widely as before and is an example of a job which will have to be trained by the employer.”

Survey question 6: In 2025, what do you think will be the three most important forms of educational support existing to provide industry with a ready supply of competent employees?

When changing focus from industry to education, participants provided several ideas of what initiatives schools should undertake in order to ensure viable future employees. Participants most frequently mentioned stronger industry-school partnerships as a potential successful initiative for preparing students. This reinforces the answers given in survey question
number 3 which asked about current initiatives. One panelist specified the need for teachers to understand industrial needs. “Employees will need to exit high school with applied math (analyze data for problem solving) skills. Teachers will need to gain a specific understanding of career opportunities in manufacturing. Career paths for specialized skills (like electricians, maintenance repair) need to be identified.”

Another panelist mentioned career placement as a potential benefit to increased industry-school collaboration. “In colleges you have coop programs to place college grads into jobs. Why wouldn’t that same concept to work in high schools?” Multiple participants mentioned the need to increase specified post-secondary training at the high school level.

Question 7: In your judgment, what are the three most critical changes that K-12 education should make to develop workers with the characteristics that will make them successful and valuable employees for industry in the year 2025?

When answering survey question 7, participants offered several suggestions for critical education changes with less consensus than was represented in other questions. These responses resulted in several outliers, indicating less central tendency among responses than in other questions. The most frequently mentioned initiative was expanding the amount of career technical course clusters. These clusters are grouped offerings of career and technical education courses in the same field. Some participants suggested that increased industry awareness among Career Technical Education (CTE) instructors could help strengthen CTE programs. One panelist suggested the need for better “coordination of analytical knowledge-based training, coordination of technical training in schools to match industry needs and more educators participating in industry based training to better understand the requirements of employees.”
Following increased CTE cluster opportunities, six other suggestions received multiple mentions including encouraging attendance, opportunities for business learning in the classroom, life skills lessons, lessons in work ethic, soft skills education, and increased technology courses. According to one panelist, “Educational support needs to focus on two levels. One level will be the managers of industry. These people need to be groomed for handling people and vision. The second level will be the workers. Educational support needs to focus on computers/technology, soft skills like work ethic, pride in physical work, etc. The last area is one of not promoting a sense of entitlement, which is a plague on industry today.”

Survey Question 8: In your opinion, what will be the three most important forms of support that industry will receive from federal, state, and/or local government to assist industry in meeting their employment needs in the year 2025?

Within industry, participants mentioned the need to provide tuition assistance to existing employees as the most important form of support needed to maintain viable, sustainable employees. Training of this type may include going back to college to get an additional degree or going to a technical center to earn additional technical training or certification. Multiple panelists mentioned funding sources including TN Promise, state lottery money, Tennessee Reconnect, and training tax incentives as important to industry moving forward. In addition to tuition assistance, participants mentioned the need for continued industry involvement in the design of training programs and the need to recruit better teachers and/or trainers for such programs.

Survey Question 9: In your perception, what will be the three most significant differences in the characteristics of successful and viable workers of the year 2025 and the successful and viable employee of your present organization?
When considering how the future viable employee differs from the current employee, participants most frequently mentioned the employee’s technology savvy as a key characteristic. This coincides with responses in survey questions 1 and 2 when respondents mentioned the need to use technology in innovative ways and the ability to adapt to emerging technology as key characteristics. As one panelist described, “In 2025, an individual will need to have more "thinking" skills and technical skills.” Another participant noted that, “Workers will need to be life-long learners as technology continues to change; Automation will do the routine work, employees will have jobs requiring critical thinking skills; Future workers will need to more easily adapt to change.”

Additionally, panelists mentioned critical thinking, flexibility, loyalty, math skills, motivation, and ability to work in a team as characteristics of the successful worker in the year 2025. One panelist specified that future workers would need “applied math skills in high school that they can apply to problem solving on the job, better student understanding of the job opportunities in industry and the skills and education required to fill these jobs, and be workforce ready and mature.” Another noted that, “I believe in 2025 you will see more successful workers who are more analytical, self-driven, and who have a great grasp on technology in all forms.”

Survey question 10: Describe the idealized employee you will seek for your organization in the year 2025.

Two findings emerged when participants were asked to describe the idealized employee in the year 2025. First, participants reiterated the need for the future employee to be technologically savvy as previously stated in question 9. Mentioned with equal frequency was the need for the employee to be loyal to the company as shown through dedication to the job. The idealized worker was described in terms such as drug-free, dependable, flexible, innovative,
positive, and self-motivated. In describing the ideal employee of 2025, panelists indicated that this worker will have a strong attendance record, be able to communicate effectively, and be able to work in a team. Multiple participants mentioned adaptability, leadership, and innovation as well.

Survey Question 11: Please feel free to comment on any other aspect of projected skills and characteristics that will be needed for successful employment that you believe was overlooked by the above questions.

Participants who responded to this question reaffirmed their previous comments in the form of closing comments. An analysis of responses to question 11 reiterates that changes in workforce understanding and skill level are necessary. Awareness of industry and workplace needs as well as new approaches to educating, recruiting, and hiring will be necessary to ensure that entry-level workers in the year 2025 are available and sustainable.

Summary of Survey Round 1

Delphi panelists offered great insight in their narrative responses to questions submitted in Round 1 of the study. Analysis of the data revealed emerging levels of consensus among industry and workforce leaders in the Lakeway Area regarding needs and desired attributes of future workers. These elements formed the basis of questions for Round 2 of the study.

Round 2: A Quantitative Approach

After compiling results of the first questionnaire, the researcher utilized frequency tables to organize the data. Due to changes in work assignment and duties, two of the panelists were unable to participate in the second round changing the panel size to 18. Answers to the first round of items were analyzed inductively in order to determine emerging areas of consensus among panelists. The researcher identified the responses that indicated the greatest degree of
agreement among Delphi members from Round 1 and developed the questions for Round 2. Responses from questions in the 11-item Round 1 survey were grouped according to their corresponding overarching research question. This allowed the researcher to design the Round 2 survey in direct alignment to the three research questions of the study. Participants were presented with characteristics or initiatives that received multiple mentions in the Round 1 survey. Delphi panelists were asked to use a Likert scale to indicate if characteristics or initiatives were critical (5 points), considerably significant (4 points), of some importance (3 points), of little importance (2 points), or not important (1 point) to the cultivation of viable and sustainable workers in the year 2025. A statistical program was used to determine the rating average of each item, the mean, median, standard deviation, and coefficient of variation among scores for each item. This allowed the researcher to determine the order in which panelists perceived the importance of each characteristic or initiative. A higher rating average indicated a higher perception of importance among panel members while a lower rating average indicated lower consensus among Delphi panel members. The standard deviation and coefficient of variation indicated the degree of agreement among panelists regarding the importance of each item.

**Research Question 1.** What will be the competitive characteristics of a viable and sustainable worker in the year 2025?

Analysis of results for question 1 shows that the Delphi group is in agreement that the twenty characteristics generated from the results of survey Round 1 are each important indicators of a viable and sustainable employee of the year 2025. Utilizing an average when applying the same point system as utilized by respondents, each of the 20 items was deemed to be between
“critical” and “significantly important.” Table 1 displays the level of importance indicated by the panel in rank order.

Item # 1-A: Ability to manage a task including planning, time management, tracking data, and organization of work.

The rating average for this item was 4.53 with a mean of 1.47, a standard deviation of .78, a coefficient of variance of .53, and it ranked 12th out of the 20 items included in the research question. Of the 18 panelists, 88% indicated this item was either critical or of considerable importance while one panelist indicated that ability to manage a task was of little importance, and one panelist did not respond to this item.

Item # 1-B: Computer literacy including MS Office, Excel, and network security.

Panelists’ responses resulted in computer literacy receiving a rating average of 4.67 with a mean of 1.33, a standard deviation of .75, a coefficient of variance of .56, and it ranked 6th out
of the 20 items of this research question. Of the 18 panelists, 94% indicated this item was either critical or of considerable importance while one panelist indicated that computer literacy was of little importance.

Item # 1-C: Verbal communication skills including the ability to make oral presentations

The panelists asserted that the ability to communicate verbally, including when making oral presentations was of some importance to the future viable and sustainable employee of 2025. This item received a rating average of 4.22 with a mean of 1.78, a standard deviation of .85, a coefficient of variance of .47, and it ranked 16th out of the 20 items of this research question. While 83% of panelists rated verbal communication as critical or considerably important, one panelist indicated it was of some importance, and one panelist rated the item as being of little importance.

Item # 1-D: Adaptability to the changing workplace.

The Delphi group expressed the need for future workers to be adaptable to various changes in the workplace. This item received a rating average of 4.56 with a mean of 1.44, a standard deviation of .60, a coefficient of variance of .41, and it ranked 10th out of the 20 items of this research question. One hundred percent of panelists indicated that adaptability is at least of some importance while 94% of panelists rated the item as critical or significantly important, and one panelist indicated it is of some importance.

Item # 1-E: Interpersonal skills including the ability to work in a team.

One hundred percent of the Delphi panel group asserted that interpersonal skills, including the ability to work on a team, would be either a critical or considerably significant characteristic of a viable and sustainable employee in the year 2025. Interpersonal skills
received a rating average of 4.56 with a mean of 1.44, a standard deviation of .50, a coefficient of variance of .34, and it ranked 11th out of the 20 items of this research question.

Item # 1-F: General physical wellbeing including stamina, endurance, and being drug-free.

The expert group indicated a need for future employees to be of a general physical wellbeing including stamina, endurance, and being drug-free. This item received a rating average of 4.50 with a mean of 1.50, a standard deviation of .69, a coefficient of variance of .46 and it ranked 13th out of the 20 items of this research question. All 18 experts indicated that this item was of either critical, considerable, or some importance.

Item # 1-G: Ability to be self-motivated and show initiative.

The panelists posited that the ability to be self-motivated and show initiative would serve the future worker. This item ranked 8th out of the 20 items of the research question. This item received a rating average of 4.61 with a mean of 1.39, a standard deviation of .49 and a coefficient of variance of .41. The group indicated a high level of importance of self-motivation with 61% of panelists rating this item as critical, and the remaining 39% rating it considerably important.

Item # 1-H: Dependability as exhibited by strong attendance, promptness, and commitment.

The Delphi expert group indicated that dependability was a desired characteristic of the viable and sustainable employee of 2025. In the survey, this item received a rating average of 4.88 with a mean of 1.12, a standard deviation of .32, and a coefficient of variance of .28. The relatively low coefficient of variance indicates strong consensus among the group about the importance of dependability. This item ranked 3rd out of the 20 items in this research question.
Item # 1-I: Mathematical computational skills.

When considering mathematical computation skills, the Delphi group ranked this characteristic 15th out of 20 characteristics. Analysis of this item reveals a rating average of 4.24 with a mean of 1.76, a standard deviation of .55, and a coefficient of variance of .31. All 18 of the Delphi group experts rated this characteristic as critical, considerably important or of some importance.

Item # 1-J: Ability to solve problems using critical thinking and analysis.

The ability to solve problems through the use of critical thinking and analysis skills was noted by the Delphi group as a necessary skill of the viable and sustainable employee in the year 2025. This item received a rating average of 4.74 with a mean of 1.28, a standard deviation of .45, a coefficient of variance of .35, and it ranked 4th out of the 20 items of this research question, putting it in the top 20% of all characteristics indicated as important by the panel.

Item # 1-K: Listening skills.

Responses to this item assert that the ability to listen will be a quality of a successful future worker. This item received a rating average of 4.72 with a mean of 1.28, a standard deviation of .45, a coefficient of variance of .35, and it tied with the ability to solve problems and think critically as 4th out of the 20 items of this research question.

Item # 1-L: Effective, concise written communication skills.

The responses to this item indicate that effective written communication would be an attribute of future successful employees. This item received a rating average of 4.28 with a mean of 1.72, a standard deviation of .65, and a coefficient of variance of .37. Results indicate that effective communication ranked 14th out of the 20 items of this research question.
Item # 1-M: A strong work ethic.

A strong work ethic received the highest rating average of all 20 characteristics in the research question, ranking it first among important characteristics. Work ethic received a rating average of 4.94 with a mean of 1.06, a standard deviation of .23, and a coefficient of variance of .21. Of the 18 panelists, 17 rated strong work ethic as critical to future employees, and one indicated that it was of considerable importance.

Item # 1-N: Ability to make sound decisions.

The panelists indicated that the ability to make sound decisions would be a necessary attribute of future employees. This item received a rating average of 4.61 with a mean of 1.39, a standard deviation of .49, a coefficient of variance of .35 and it ranked 9th out of 20 characteristics listed in this item. All of the Delphi group ranked the ability to make sound decisions as critical or of considerable importance.

Item # 1-O: A positive, respectful attitude.

A positive, respectful attitude was noted as a characteristic of a future viable and sustainable employee in the year 2025. Respondents rated this characteristic with a rating average of 4.76 with a mean of 1.33, a standard deviation of .47, and a coefficient of variance of .56. These statistics assign a positive, respectful attitude to a rank of 7th out of 20 characteristics in the research question.

Item # 1-P: Personal integrity.

There was a strong degree of consensus among the Delphi panel members that personal integrity would be an important attribute of a viable and sustainable employee of the future. This item received a rating average of 4.89 with a mean of 1.11, a standard deviation of .65, and a
coefficient of variance of .37. Personal integrity was ranked 2nd out of 20 characteristics listed in the research question.

**Item # 1-Q: Ability to utilize weights and measurement.**

The ability to utilize weights and measurement received enough indication in Round 1 to be included in Round 2. However, this characteristic did not receive a high degree of rank or consensus of importance among Delphi panelists in Round 2. These skills received a rating average of 4.00 with a mean of 2.00, a standard deviation of .49, a coefficient of variance of .24, and it ranked 20th out of 20 characteristics in this research item.

**Item # 1-R: Creativity (thinks outside the box).**

The panel of experts expressed that creativity, or the ability to think outside the box, would be a necessary characteristic of a future worker. Creativity received a rating average of 4.22 with a mean of 1.78, a standard deviation of .63, a coefficient of variance of .35, and it tied with verbal communication and the ability to multi-task in ranking 16th out of 20 characteristics in this research item.

**Item # 1-S: Ability to Multi-Task.**

Successful workers in the year 2025 will possess the ability to multi-task in their work. In the survey, this item received a rating average of 4.22 with a mean of 1.78, a standard deviation of .71, and a coefficient of variance of .39. The ability to multi-task tied with verbal communication and creativity in being ranked 16th out of 20 characteristics in this survey.

**Item # 1-T: Advanced, position-specific skills.**

Members of the expert group indicated that viable and sustainable employees in the year 2025 would possess advanced, position-specific skills for use in their work, though it was not ranked highly when rated with consideration to other skills. This item received a rating average
of 4.11 with a mean of 1.89, a standard deviation of .57, a coefficient of variance of .30, and it ranked 19th out of 20 characteristics listed in the research question.

**Research Question 2.** What will successful companies do to ensure the availability of competent workers in the year 2025?

Analysis of results for question 2 showed that the Delphi group believes that participation in industry and school partnerships will be most important for companies in the future. Several other initiatives received marks that indicated some level of importance by 100% of panel members. These initiatives included: develop pay scales commensurate with skill level, participate in soft skills and/or work ethic training, expand advancement opportunities for employees, expand in-house training programs, expand apprenticeship programs, provide extensive benefits packages, provide in-house technology training, and participate in industry-school grant opportunities.

There was a moderate degree of consensus regarding initiatives including an increase in the number of student internships, participation in teacher externship programs, providing tuition reimbursement or scholarships for job-related training, and offer flexible scheduling for employees. At least one panelist indicated each of those initiatives were of little importance. The statistical data from Research Question #2 is organized in Table 4.2.

**Item # 2-A: Participate in industry-school partnerships.**

The belief that successful companies will participate in industry-school partnerships to ensure viable and sustainable employees in the future received strong support from the Delphi group. This initiative received a rating average of 4.50 with a mean of 1.50, a standard deviation of .60, and a coefficient of variance of .40. Participation in industry-school partnerships ranked first in the list of 13 initiatives listed in this research question. Of the panel of experts, 55%
believed participation in these partnerships was critical, 38% believed it was considerably important, and one respondent ranked the initiative as being of some importance.

**Item # 2-B: Provide extensive benefits packages.**

The opinion that providing extensive benefits packages to employees was also noted as an important initiative of future successful companies. Extensive benefits packages ranked 7\textsuperscript{th} in the list of 13 initiatives listed in this research question. This initiative received a rating average of 4.11 with a mean of 1.89, a standard deviation of .66, and a coefficient of variance of .39.

**Item # 2-C: Increase the number of student internships.**

There was moderate support for the initiative of increasing the number of student internships. The members of the panel recognized this initiative as ranking 8\textsuperscript{th} in the list of 13 items listed in this research question. This initiative received a rating average of 4.06 with a mean of 1.94, a standard deviation of .91, and a coefficient of variance of .46. The relatively

<table>
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<th>Initiatives</th>
<th>Critical</th>
<th>Considerably Significant</th>
<th>Some Importance</th>
<th>Little Importance</th>
<th>Net Important</th>
<th>Rating Average</th>
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<td>1</td>
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higher level of coefficient of variance indicates lower consensus around this initiative which one panelist rated as being of little importance to future successful companies.

Item # 2-D: Expand apprenticeship programs.

According to the consensus of the expert panel, expanding apprenticeship programs will be helpful in producing future viable and sustainable employees. This initiative received a rating average of 4.22 with a mean of 1.78, a standard deviation of .71, and a coefficient of variance of .39. All of the panel members rated expansion of apprenticeship programs as critical, significantly important, or of some importance.

Item # 2-E: Expand in-house training programs.

The Delphi panel indicated that expansion of in-house training programs would be important to future successful companies. All of the Delphi experts rated in-house training expansion as critical, considerably important, or of some importance, and 61% of respondents indicated that this initiative is of considerable importance. This initiative received a rating average of 4.28 with a mean of 1.72, a standard deviation of .56, a coefficient of variance of .32, and ranked 5th out of 13 initiatives listed in this research question.

Item # 2-F: Expand advancement opportunities for employees.

Expansion of advancement opportunities was noted as an initiative of companies that will maintain viable and sustainable employees in the year 2025. This initiative received a rating average of 4.33 with a mean of 1.67, a standard deviation of .58, a coefficient of variance of .36, and ranked 4th out of 13 initiatives listed in this research question. Of the panel of experts responding, 94% indicated that this initiative was critical or considerably important, while one panelist indicated that it was of some importance.

Item # 2-G: Develop pay scales commensurate with employee skill level.
Vigorous support was noted for the development of pay scales that are commensurate with employee skills level. This initiative ranked 2\textsuperscript{nd} in the list of 13 initiatives listed in the research question. Fifty-five percent of panelists rated this initiative as critical to future successful companies. This initiative received a rating average of 4.44 with a mean of 1.56, a standard deviation of .68, and a coefficient of variance of .43.

**Item # 2-H: Participate in teacher externship programs.**

The panel of experts indicated that participation in teacher externship programs would be an important initiative to future successful companies, though at varying degrees. This initiative received the highest coefficient of variance, indicating lower consensus among the Delphi panel. Participation in externship programs received a rating average of 4.06 with a mean of 1.94, a standard deviation of .97, and a coefficient of variance of .50. This initiative tied student internships and in-house technology training for a ranking of 8\textsuperscript{th} out of 13 initiatives listed in this research question.

**Item # 2-I: Offer flexible scheduling for employees.**

The lowest ranking among the 13 initiatives was assigned to the initiative of offering employees flexible scheduling. Though the initiative received multiple mentions in the Round 1 survey, it received a rating average of 3.50 with a mean of 2.5, a standard deviation of .90, and a coefficient of variance of .36. Of the 18-member panel, 88% indicated that flexible scheduling was either critical, considerably important, or of some importance while one member indicated that it was of little importance and one member indicated it was not important.

**Item # 2-J: Provide in-house technology training.**

In considering the provision of in-house technology training, the panelist indicated that the initiatives would be important. This initiative received a rating average of 4.06 with a mean
of 1.94, a standard deviation of .52, and a coefficient of variance of .26. This initiative tied student internships and teacher externships for a ranking of 8th out of 13 initiatives in the research question.

**Item # 2-K: Participate in soft skills and/or work ethic training.**

There was strong support for the belief that successful companies of the future would participate in soft skills and/or work ethic training. This initiative ranked 3rd in the list of 13 initiatives listed in the research question. Soft skills and/or work ethic training received a rating average of 4.39 with a mean of 1.61, a standard deviation of .58, and a coefficient of variance of .30. The relatively small coefficient of variance indicates strong consensus among the group regarding this ranking.

**Item # 2-L: Expand apprenticeship programs.**

Expanding apprenticeship programs received moderate support from the Delphi group. This initiative received a rating average of 4.22 with a mean of 1.78, a standard deviation of .71, a coefficient of variance of .39, and ranked 6th out of 13 initiatives listed in this research question. All 18 Delphi panel members indicated that expanding apprenticeship programs was either critical, considerably important, or of some importance.

**Item # 2-M: Provide tuition reimbursement or scholarships for job related training.**

Receiving less vigorous support was the provision of tuition reimbursement or scholarships for job-related training. This initiative received a rating average of 4.06 with a mean of 1.94, a standard deviation of .91, a coefficient of variance of .46, and ranked 11th out of 13 initiatives listed in this research question. The relatively high coefficient of variance indicates low consensus among panel members regarding this initiative with 38% rating the initiative as
critical, 33% rating it as considerably important, 22% rating it as being of some importance, and one panel member rating it as of little importance.

Item # 2-N: Participate in industry-school grant opportunities.

The concept of participation in industry-school grant opportunities received some support among the Delphi panel of experts. The initiative rated 12\textsuperscript{th} out of 13 initiatives listed in the research question. Grant opportunities received a rating average of 4.00 with a mean of 2.0, a standard deviation of .82, and a coefficient of variance of .41.

Research Question 3. What changes in public education will be required to meet industry’s needs in the year 2025?

Analysis of results for research question 3 showed that the Delphi group believed that expanding and aligning career and technical education courses was of most importance for enabling industry to hire viable and sustainable employees in the year 2025. Also indicated as important was an emphasis on technology at all levels and an emphasis on critical thinking and analysis skills. While none of the items received ratings of little importance or not important, there was less degree of consensus among items including expand student internship opportunities, strengthen dialogue between K-12 and industry, provide opportunities for early career exploration, expand teacher externship opportunities, and increase opportunities for business experiences in school.

Item # 3-A: Expand and align Career-Technical Education courses.

There was strong support from the Delphi panelists for the expansion and alignment of Career-Technical Education courses. This initiative ranked 2\textsuperscript{nd} out of the 9 initiatives related to this research question. This initiative received a rating average of 4.83 with a mean of 1.17, a standard deviation of .37, and a coefficient of variance of .31. Of the panelists, 83% of Delphi
members rated this initiative as critical while the remaining 17% rated it as considerably significant.

Item # 3-B: Emphasize technology at all levels.

The panel expressed a belief that schools should emphasize technology at all levels. This initiative ranked 3rd in the list of 9 items in this research question. Emphasis of technology received a rating average of 4.72 with a mean of 1.28, a standard deviation of .56, and a coefficient of variance of .43. Ninety-four percent of the panelists rated this initiative as either critical or of critical importance, while one member rated emphasis of technology as being of some importance.

Item # 3-C: Expand student internship opportunities.

The Delphi group agreed that expansion of student internship opportunities would be an initiative of schools that produce viable and sustainable employees in the year 2025. However, the relatively high coefficient of variance indicated a lower consensus among panel members regarding the rating of this initiative. Expansion of student internship opportunities received a
rating average of 4.33 with a mean of 1.67, a standard deviation of .75, a coefficient of variance of .44, and ranked 7th out of 9 initiatives listed in the research question.

**Item # 3-D: Strengthen dialogue between K-12 education and industry.**

Moderate support was expressed among panelists regarding the need for successful schools of the future to strengthen dialogue with industry. This initiative received a rating average of 4.50 with a mean of 1.50, a standard deviation of .69, and a coefficient of variance of .46. Strengthening school-industry dialogue ranked 6th out of 9 initiatives related to this research report.

**Item # 3-E: Provide opportunities for early career exploration (career fairs, early skills identification, etc.).**

Likewise, moderate support was expressed for the provision of opportunities for early career exploration for students. Career exploration ranked 5th out of 9 initiatives in this research question. This initiative received a rating average of 4.56 with a mean of 1.44, a standard deviation of .60, and a coefficient of variance of .41.

**Item # 3-F: Emphasize critical thinking and analysis skills at all levels.**

Panel members noted that successful schools of the future would emphasize critical thinking and analysis skills at all levels. This initiative received a rating average of 4.61 with a mean of 1.35, a standard deviation of .49, and a coefficient of variance of .35. Critical thinking and analysis ranked 4th out of 9 initiatives in this research question.

**Item # 3-G: Offer soft skills programming to include teaching work ethic, responsibility, promptness, etc.**

The panelists expressed a strong belief that the offering of soft skills programming in schools would have an impact on the school’s ability to produce viable and sustainable
employees in the year 2025. This initiative received the highest rating average of all initiatives in this research question. Soft skills programming received a rating average of 4.89 with a mean of 1.11, a standard deviation of .31, and a coefficient of variance of .27. The relatively low coefficient of variance indicates a strong degree of consensus among respondents regarding the high rating of this initiative.

**Item # 3-H: Expand teacher externship opportunities.**

Expansion of teacher externship opportunities received the lowest rating average among the 9 initiatives related to this research question. For this item, 33% of respondents indicated that this initiative was critical, 39% rated it as considerably important, and 38% rated it as being of some importance. Teacher externships received a rating average of 4.06 with a mean of 1.94, a standard deviation of .78, and a coefficient of variance of .40.

**Item # 3-I: Increase opportunities for student business experiences (JA BizTown, co-op, etc.)**

Also receiving a lower rating average was the need to increase opportunities for student business experiences while in school. The initiative ranked 8th out of 9 initiatives listed in this research question. This initiative received a rating average of 4.11 with a mean of 1.89, a standard deviation of .66, and a coefficient of variance of .34.

**Summary of Survey Round 2**

This chapter contained the analysis of the Round 2 iteration of the study. This round was used to narrow consensus among the expert group concerning characteristics of viable and sustainable employees in the year 2025 and the work required of both industry and K-12 schools to ensure the availability of these employees in the Lakeway Area. Round 2 of the survey was organized around the three research questions. The opinions of the Delphi group were measured
by rating responses on a Likert scale. The Delphi group indicated specific characteristics and school and industry initiatives in order to meet the forecast needs of industry in the future.
CHAPTER 5: CONCLUSIONS

The relationship between school and the workforce is a significant one in that schools serve as the primary source for preparing community members to function in local society. For generations, schools either prepared students for a university path or vocational school. However, today’s call is for schools to prepare students for college and career, strategically preparing students for a productive life after high school graduation. This call for college and career readiness of all students reveals a need for articulation of what characterizes one who is workforce ready and who, therefore, is positioned for viable, sustainable employment.

The purpose of this study was to examine the unique needs of the Lakeway Area of upper East Tennessee as perceived by workforce and employment leaders, as well as what initiatives they believe will allow companies to recruit and maintain viable, sustainable employees of the future, and what initiatives will allow schools to better prepare graduates to be viable, sustainable employees. The study is replicative of the same study conducted by Dean in 1999 and seeks to determine how workforce experts’ opinions have changed over time and require new efforts of business and education. The study used the Delphi method as described in Chapter 3. Though the Delphi technique is not used to produce results that are statistically significant, it is used to generate consensus among a selected expert group (Hsu & Sanford, 2007). Chapter 3 also includes the purposeful selection used to select panelists. Chapter 4 included an analysis of the data generated in both rounds of the survey.

Round 1 responses were generated in narrative form through the use of open-ended questions about desired characteristics of workers in the year 2025, efforts required of future companies to recruit and maintain desired employees, and efforts required of schools to produce
graduates who embody desired characteristics. The consensus of the Delphi group was refined by the second survey iteration.

Round 2 generated responses using a Likert scale, allowing the researcher to analyze quantitative data in order to further determine group consensus about viable, sustainable employment in the year 2025. While the panelists agreed that all 60 items listed in the Round 2 instrument were important, responses indicated that the perception of the level of importance varied among panelists. From the results of the Round 2 survey, a forecast regarding the characteristics of desirable employees can be made. Items in both Round 1 and Round 2 were designed to provide panelists with an opportunity to share insight into the following three research questions.

1. What will be the competitive characteristics of a viable and sustainable worker in the year 2025?
2. What will successful companies do to ensure the availability of competent workers in the year 2025?
3. What changes in public education will be required to meet industry’s needs in the year 2025?

Chapter 5 synthesizes the perceptions of the Delphi group and is organized around the three research questions.

**Research Question # 1 Conclusions**

*What will be the competitive characteristics of a viable and sustainable worker in the year 2025?*

The consensus belief of the panel was that in the year 2025, the desirable employee would be characterized by a set of personal qualities rather than a specified set of technical
skills. In Round 1, analysis of the narrative responses from the Delphi group yielded a list of 20 characteristics with multiple mentions from panel members. Of these twenty characteristics, 80% could be categorized as soft skills. Only 20% of responses were competency-based skills that can be measured.

The panelists expressed the belief that a strong work ethic would be an imperative attribute of a viable, sustainable employee of the future. Supporting this strong work ethic in the desirable worker will be a sense of personal integrity and pride in one’s work, a positive and respectful attitude, and dedication to attending work. This worker will be self-motivated and show initiative in doing a job well.

In addition to having a strong work ethic, the panel posited that the viable and sustainable employee of 2025 will be a critical thinker. The successful employee of the future will be able to solve complex problems using non-routine, creative solutions. Panelists indicated that desirable employees in the year 2025 will be able to be trusted to make sound decisions. He or she will be able to attend to multiple tasks through the use of effective planning, time management, problem solving, and attention to detail.

The panel further characterized the viable, sustainable employee of 2025 as being one who can work in an effective collaborative environment through the employment of well-developed interpersonal skills. This employee will possess highly developed listening skills when working with peers and superiors. Likewise, he or she will be able utilize effective, concise communication, both written and oral, for effective discourse in the workplace.

Overarching the idea of a well-developed set of soft skills is the opinion expressed by the panel that the desired future employee will possess the ability to adapt to an ever-changing workplace. As the needs of companies and industries change, the worker will be able to shift in
order to meet the company’s needs. This adaptability adds specifically to the sustainability of a worker in the company.

Though to a lesser degree than soft skills, the panelists did define some measurable, technical skills and characteristics as indicators of a viable, sustainable employee of the year 2025. Panelists indicated that desired future employees would be computer literate with a firm grasp on the use of the Microsoft Office suite of software including Word, PowerPoint, and Excel. Future successful companies will seek to hire employees with mathematics computational skills as well. These employees will be of a general, physical well-being as evidenced by stamina and endurance.

The purpose of the study was to forecast characteristics of a desired worker of the future. Responses of the Delphi panel indicated consensus around the characteristics of such a worker in the year 2025. Throughout the study, the panel of experts expressed that desirable future employees would be driven by the desire to secure and maintain a position with a company, to do a good job, and to remain loyal and dedicated to a company in serving its ever-changing needs.

**Research Question # 2 Conclusions**

What will successful companies do to ensure the availability of competent workers in the year 2025?

There was clear consensus among the Delphi group members that there are initiatives that industry can undertake in order to create a future company culture that promotes the development and nurtures the sustainability of workers. Responses to the qualitative type questions of Round 1 resulted in a list of 18 company initiatives that served as the items for Round 2. These initiatives can be categorized into three major areas: partnerships with
education entities for quality workforce development, in-house training opportunities, and changes to human resources systems and structures.

Panelists indicated that strong consensus exists around the need for successful companies of the future to participate in collaborative settings with education entities including local K-12 school systems, community colleges, and technical schools. The most important initiative as determined by Delphi panelists’ responses is the need for companies to participate in industry-school partnerships. These partnerships might take the form of dialogue generated in structured communication opportunities, company input into course standards, or participatory programming for students. The panelists indicated that opportunities for students to participate in apprenticeships or internships would be an initiative undertaken by future successful companies. Additionally, panelists posited that programming with teachers such as teacher externship opportunities would be beneficial in the future. Additionally, though to a lesser degree of importance, the expert group indicated that participation in industry-school grant opportunities could assist in developing a more desirable workforce. Initiatives that involve company and school partnerships made up 38% of the items generated by participant responses for Research Question 2.

The Delphi group expressed consensus around the idea that companies could undertake training initiatives that would enhance the availability of viable, sustainable employees in the future. The group expressed the strongest conviction in the need for companies to participate in soft skills or work ethic training within the company. Such training would prepare workers to exhibit the characteristics that were generated in Research Question 1. Strong consensus also existed in the belief that future successful companies would expand in-house training opportunities specific to the company’s needs. Additionally, future successful companies
would provide expanded in-house technology training. Such training would allow companies to train employees in technology specific to the job site. The panel also suggested that in the future, companies would provide tuition reimbursement or scholarships for training that takes place outside the workplace. These trainings might take place in college settings or in technical schools. The prevalence of internal training initiatives in the responses of Delphi group members suggests that future companies, when pulling from a qualified workforce will be able to provide company-designed training in order to enhance the viability and sustainability of future employees. Initiatives that involve enhanced training for employees made up 21% of the items generated by participant responses for Research Question 2.

The panel of experts expressed conviction that companies that employ viable, sustainable workers in the year 2025 would have human resources systems and structures that differ from those today. Panelists expressed a belief that successful companies of the future will develop pay scales that are commensurate with employee skill level. In addition to altering pay scales, panelists suggested that successful companies in 2025 will expand opportunities for employee advancement within the company. Such advancement will add to the sustainability of employees, thus developing the loyalty described in responses to Research Question 1. The Delphi group exhibited strong consensus around the belief that future companies will be successful in hiring desirable workers if they offer extensive benefits packages to employees. Although assigned a lesser degree of importance, offering future employees flexible scheduling was also an initiative generated by panelists. Initiatives that involve changes to human resources systems and structures made up 21% of the items generated by participant responses for Research Question 2.
Research Question # 3 Conclusions

What changes in public education will be required to meet industry’s needs in the year 2025?

The panel expressed ardent support for public education to take part in the development of a successful future workforce. The role of successful school systems in workforce development will take the form of partnership with business and industry and in strategic workforce readiness initiatives. The results indicate that panelists believe that schools can help prepare viable, sustainable future employees with intentional adjustments to general instructional practices and expansion of student opportunities for workforce preparedness.

The Delphi group stated the importance of teaching soft skills to students including work ethic, responsibility, and promptness. Several panel members specifically mentioned the need for students to be held accountable for responsibilities in order to develop a workforce that takes pride in earning both wages and respect. The high level of consensus exhibited by the panel of experts indicates a belief that work ethic can be taught with intentional instruction and opportunities for development.

Furthermore, the panelists stated the importance of expanding and aligning Career and Technical Education courses in the future. These courses are typically designed to teach skills specific to a vocation, allowing students to prepare for a particular job through high school course work. As college and career readiness moves to the forefront, offerings of Career and Technical Education courses have expanded. Additionally, as dialogue between school and business strengthens, these courses are better aligned to the equipment, skills, and needs of the respective vocation. The panel expressed that the continued expansion and alignment of Career-Technical Education will serve the development of a prepared workforce in the future.
Guidance about a future career path will also be necessary for the development of viable, sustainable employees in the future. Students will benefit from earlier career exploration through programs such as job fairs and career days. Additionally, early skills identification coupled with counseling about career paths that may match those skills will assist students in selecting careers that match their strengths. In addition to traditional career counseling, schools that are successful in developing future workers will provide students with workplace-like experiences in school. These experiences can take place in the classroom setting or in programs such as Junior Achievement BizTown wherein students participate in a simulated town and assume the roles of workers and consumers.

Underpinning all the initiatives that the Delphi group believes successful schools will undertake is the idea that schools will strengthen dialogue with industry. The existence of strong school-business partnerships will allow learning to be better aligned to the authentic environments, skills, and needs of the workplace. The continuance of this dialogue will allow schools to adjust and continually align to changing workforce needs.

**Connections to the Original Study**

When Dean conducted the same study in 1995, the industrial landscape of the Lakeway Area was quite different. Industry of the Lakeway Area in the 1990s was characterized by large-scale manufacturing businesses in the textile, chemical, and automotive sectors. The Delphi panel of the 1995 study consisted exclusively of leaders of industrial and manufacturing businesses found in a ten-county service area.

Since 1995 manufacturing businesses have continually moved out of the area, and the profile of the workforce in the area has changed. Today, only half of the largest employers in the area are manufacturers. This leaner industrial complex and changing workforce landscape
led to a defined identity of the five-county Lakeway Area as a multi-county service area. Citizens in the Lakeway Area travel across county lines in search of employment, making the cities, counties, and employment services representatives work together in recruiting business and industry and the workers who fill workforce needs. In addition to those industrial settings, employees work in service, retail, and healthcare settings. In fact, the largest employer in the Lakeway Area is the Hamblen County school system. These regional changes also altered the profile of the Delphi group in the replication. There were more representatives from service industries as well as workforce and employment leaders in the purposefully sampled expert panel.

Despite the significant changes in the workforce landscape, a comparison of responses from workforce leaders revealed remarkable similarities. The Delphi panel of the 1995 study by Dean indicated that a strong work ethic was the most important characteristic of the ideal employee of the year 2015. The current Delphi participants ranked this same characteristic number one. Further, of the 23 characteristics of the ideal employee forecast by the 1995 Delphi group and the 20 identified by the 2017 Delphi group, only two characteristics were unique to the 1995 list of characteristics, and one was unique to the 2017 list. Panelists in 1995 identified high school graduation and capability in learning Statistical Process Control as desirable traits. Panelists in 2017 added the ability to use weights and measurement as a desirable trait. All other traits that were from identified by the 1995 Delphi group were referenced in some way in the responses of the 2017 group. The fact that all three of the skills unique to only one of the groups are measurable, technical skills could be a result of the changing industrial landscape.

Similarities also existed between the responses of both groups regarding initiatives that
industry will undertake to ensure the availability of viable, sustainable employees. The 1995 Delphi group identified the need for companies to establish a culture that values and respects the worker. The 2017 group mentioned extending benefits packages, enhancing pay scales, pay for training, and flexible scheduling opportunities, all of which seek to honor the personal needs of the worker. Both expert groups indicated that on-the-job, or in-house training would be necessary for future successful companies. Additionally, a theme of working with K-12 education also ran through the responses of both groups, with both Delphi panels indicating that curriculum alignment, apprenticeships, and school-business partnerships would be vital initiatives for business and industry.

This same theme of school-business partnership existed in an analysis of responses of both groups regarding forecast initiatives of public education. Both groups indicated that cooperative development and alignment of courses, an increased emphasis on technology, and expansion of opportunities for teachers to engage in work with industry would be important initiatives. Some differences exist in the forecast of other school initiatives. The 1995 group listed initiatives that delineated the need to develop proficiencies including math and writing. Further, they specified the need for classes in electronics and maintenance in their forecast. Additionally, they mentioned the need to incorporate teaching of conflict resolution, tolerance and diversity, and practical problem solving. The 2017 group did not list responses that indicated the need for changes to specific course offerings or the need for an increase in math and reading proficiency. Rather, they emphasized the need for soft skills education and agreed with the need for an increased emphasis on technology at all levels. The lack of responses by the 2017 group could be a result of changes to K-12 education over the past 20 years that have increased the rigor and competency requirements in math and reading, including the Tennessee
Diploma project and the introduction of the Common Core State Standards. Additionally, in 2015 employers in three of the five counties participated in workforce readiness initiatives funded by state grant monies which may have informed their ideas about how to partner with schools.

Both Delphi panels agree that future employees will possess a set of personal qualities that will make them adaptable, loyal, and dependable. They agree that successful companies need to partner with school systems in order to align their efforts in the development of a viable, sustainable workforce. Finally, both panels reported that school systems play an important role in developing students who will graduate with soft skills and competencies developed through participation in an education that is aligned with and open to the needs of business.

**Recommendations for Further Research**

The following recommendations are offered for consideration for further research.

The results of the study generated broad categories of desired characteristics and successful initiatives that schools and industry will undertake in order to generate a viable, sustainable workforce. These categories include soft skills needed by future employees, effective internal training programs of successful companies, and effective educational programs for teaching work-aligned skills. Each of these categories is worthy of further study.

Another recommendation is that the study be expanded to include areas beyond the Lakeway Area of upper East Tennessee. Further research could examine the same findings when surveying all of East Tennessee, the state of Tennessee, or the Southeast Region of the United States. Expanding the study would allow the researcher to determine how the findings of this study align or differ from the findings of a larger region.

A third recommendation offered is to conduct studies that reveal the forecast traits of
future employees in a management or supervisory position. The members of the Delphi panel in this study focused primarily on entry-level employees. However, the skill set of an employee who is able to move into a management or leadership position could be the subject of additional research.

**Summary**

This study was developed to forecast the characteristics of a viable, sustainable employee in the year 2025. At the time of publication, the entry-level employees of 2025 are the fifth grade students of today. The results of this study forecast the initiatives that companies and schools must undertake in order to develop graduates who possess the set of characteristics also forecast in the study. This aligned school-to-work pipeline will allow students to gain and maintain employment and business and industry to grow through the employment of a viable, sustainable workforce. Such a workforce serves as the backbone of the successful community. Companies, schools, and communities within the Lakeway Area of upper East Tennessee that wish to be successful in the future will coordinate efforts to implement strategies based on the findings of this study.
References


#sthash.diTvbSOF.dpuf

http://www.washingtonpost.com/local/education/socialization-technique-helps-in-academic-achievement-trial-study-finds/2014/03/05/674d1e0e-a495-11e3-a5fa-55f0c77bf39c_story.html


https://www.mindtools.com/pages/article/newTED_89.htm


Appendix A: Letter to Participants
Invitation to Participate

From: Jaime P Greene, jpgreene@cn.edu

My name is Jaime Greene. I am an instructional coach for Hamblen County Schools and a doctoral candidate in pursuit of my Ed.D. at Carson-Newman University. I have worked closely with the LEAP grant initiatives in providing alignment between the Department of Instruction and Workforce Alignment programs.

A local industry leader has nominated you as a person of expertise in workforce readiness in the Lakeway Area. I am seeking to establish a panel of experts to participate in a Delphi research project entitled Characteristics of Viable and Sustainable Workers in the year 2025.

This study is designed as a two-part electronic questionnaire. The first part is intended to gather experts’ opinions and perspectives on what makes a local graduate a candidate for viable and sustainable employment in our area and how schools and industry can work together. The second questionnaire will be designed after answers are collected from the first and will ask experts to rank the responses and provide a rationale.

In total, answering these questionnaires should take no more than 30 minutes of your time. The questionnaires ask only for your general perceptions. More detailed responses are greatly appreciated, but any response will help increase understanding of the definition of workforce readiness and how Lakeway Area schools can assist.

If you are willing to participate, please follow the survey link below. Please note that all identifying information will be removed from the data and there will be no source indicated for specific responses.

If you have any questions or concerns, please contact me via phone at 423-748-2824 or by email at jpgreene@cn.edu.

Sincerely,

Jaime Greene

Link to survey: https://www.surveymonkey.com/r/WorkforceReadiness
Appendix B: Questionnaire 1
Informed Consent

You are invited to participate in a research study conducted Jaime Greene, from Carson-Newman University. I hope to learn about the characteristics of viable and sustainable employees in the year 2025. You were selected as a possible participant in this study because your work gives you expert insight into the skills needed for employment in our area.

If you decide to participate, you will be asked to participate in two survey rounds using online survey software.

Risk for participants in this study is minimal as all subjects will remain anonymous and only the researcher will have access to the information gathered. Results of this survey will benefit educators by giving them insight into employer needs when preparing students for employment. However, I cannot guarantee that you personally will receive any benefits from this research.

Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission or as required by law. Subject identities will be kept confidential and only identifiable by the researcher.

Your participation is voluntary. Your decision whether or not to participate will not affect your relationship with Carson-Newman University. If you decide to participate, you are free to withdraw your consent and discontinue participation at any time without penalty.

If you have any questions about the study, please feel free to contact Jaime Greene at 423-748-2824 or jgreene@cn.edu. If you have questions regarding your rights as a research subject, please contact the IRB (IRB@up.edu). You will be offered a copy of this form to keep.

Your signature indicates that you have read and understand the information provided above, that you willingly agree to participate, that you may withdraw your consent at any time and discontinue participation without penalty, that you will receive a copy of this form, and that you are not waiving any legal claims.

* 1. Do you agree to the above terms? By clicking Yes, you consent that you are willing to answer the questions in this survey and be generally identified as a participant.

☐ Yes
Round 1 Questionnaire

Please respond to the following questions based on your general impressions. Text boxes will expand as needed.

2. In your judgment, what are the three most important general worker characteristics employers will seek in employees in 2025?

3. In your opinion, what will be the three most important characteristics or skills that successful workers in 2025 will possess in the following areas?
   - Interpersonal skills
   - Technology skills
   - Thinking skills
   - Mathematical skills
   - Communication skills
   - Organization skills
   - Physical skills

4. What do you believe are the three most important initiatives currently being undertaken by industry to ensure that an ample supply of skilled workers will be available in 2025?

5. What three initiatives by business and industry do you believe will be most successful in attracting and maintaining quality, skilled employees in the year 2025?

6. As you consider the work experience and educational training required for employment in the year 2025, what three major changes do you foresee in such programs as apprenticeships, on-the-job training, on-site training, or work-experience requirements?

7. In 2025, what do you think will be the three most important forms of educational support existing to provide industry with a ready supply of competent employees?
8. In your judgment, what are the three most critical changes that K-12 education should make to develop workers with the characteristics that will make them successful and valuable employees for industry in the year 2025?


9. In your opinion, what will be the three most important forms of support that industry will receive from federal, state, and/or local government to assist industry in meeting their employment needs in the year 2025?


10. In your perception, what will be the three most significant differences in the characteristics of successful and viable workers of the year 2025 and the successful and viable employee of your present organization?


11. Describe the idealized employee you seek for your organization in the year 2025.


12. Please feel free to comment on any other aspect of projected skills and characteristics that will be needed for successful employment that you believe was overlooked by the above questions.


13. Please enter the following:

Your Name


Your Company


Your Position


Email address for survey purposes only


Thank you for your time!
APPENDIX C: Questionnaire 2
**Round 2**

Please choose the number on the scale that best reflects the degree to which you assign the importance of each answer.

1. In 2025, the viable and sustainable worker will possess the following characteristics:

<table>
<thead>
<tr>
<th>Ability to manage a task including planning, time management, tracking data, and organization of work</th>
<th>Critical</th>
<th>Considerably Significant</th>
<th>Some Importance</th>
<th>Little Importance</th>
<th>Not Important</th>
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</thead>
<tbody>
<tr>
<td>Computer literacy including MS Office, Excel, and network security</td>
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<td>Verbal communication skills including the ability to make oral presentations</td>
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<td>Adaptability to the changing workplace</td>
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<tr>
<td>Interpersonal skills including the ability to work in a team</td>
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<tr>
<td>General physical well-being including stamina, endurance, and being drug free</td>
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<tr>
<td>Ability to be self-motivated and show initiative</td>
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<tr>
<td>Dependability as exhibited by strong attendance, promptness, and commitment</td>
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<td>Mathematical computational skills</td>
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<td>Ability to solve problems using critical thinking and analysis</td>
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<td>Listening skills</td>
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<td>Effective, concise written communication skills</td>
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<tr>
<td></td>
<td>Critical</td>
<td>Considerably Significant</td>
<td>Some Importance</td>
<td>Little Importance</td>
<td>Not Important</td>
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<tr>
<td>A strong work ethic</td>
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<tr>
<td>Ability to make sound decisions</td>
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<td>A positive, respectful attitude</td>
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<td>Personal integrity</td>
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<tr>
<td>Ability to utilize weights and measurement</td>
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<td>Creativity (thinks outside the box)</td>
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<tr>
<td>Ability to multi-task</td>
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<tr>
<td>Advanced, position-specific skills</td>
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</table>
2. In order to ensure the availability of competent workers in 2025, successful companies will pursue the following initiatives:

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<tr>
<th>Initiative</th>
<th>Critical</th>
<th>Considerably Significant</th>
<th>Some Importance</th>
<th>Little Importance</th>
<th>Not Important</th>
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<tbody>
<tr>
<td>Participate in industry-school partnerships</td>
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<tr>
<td>Provide extensive benefit packages</td>
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<td>Increase the number of student internships</td>
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<tr>
<td>Expand apprenticeship programs</td>
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<tr>
<td>Expand in-house training programs</td>
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<td>Expand advancement opportunities for employees</td>
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<td>Develop pay scales commiserate with employee skill level</td>
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<tr>
<td>Participate in teacher externship programs</td>
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<td>Offer flexible scheduling for employees</td>
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<td>Provide in-house technology training</td>
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<td>Participate in soft skills and/or work ethic training</td>
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<td>Provide tuition reimbursement or scholarships for job related training</td>
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<td>A strong work ethic</td>
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<tr>
<td>Participate in industry-school grant opportunities</td>
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</tbody>
</table>
3. In order to meet industry's needs for a competent workforce in 2025, public education will undertake the following:

<table>
<thead>
<tr>
<th>Issue</th>
<th>Critical</th>
<th>Considerably Significant</th>
<th>Some Importance</th>
<th>Little Importance</th>
<th>Not Important</th>
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<tbody>
<tr>
<td>Expand and align Career-Technical education courses</td>
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<td>Emphasize technology at all levels</td>
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<td>Expand student internship opportunities</td>
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<td>Strengthen dialogue between K-12 education and industry</td>
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<td>Provide opportunities for early career exploration (career fairs, early skills identification, etc.)</td>
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<tr>
<td>Emphasize critical thinking and analysis skills at all levels</td>
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<td>Offer soft skills programming to include teaching work ethic, responsibility, promptness, etc.</td>
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<tr>
<td>Expand teacher externship opportunities</td>
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<tr>
<td>Increase opportunities for student business experiences (JA BizTown, co-op, etc.)</td>
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</table>

4. Your name and company