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Technology for the 21st Century Workforce: A Case Study of a Rural East Tennessee Workforce Community

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Technology for the 21st Century Workforce:

A Case Study of a Rural East Tennessee Workforce Community

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by

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ABSTRACT

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The purpose of this study was to assess technology use, on-the-job technology training, education levels, and salary ranges of employees in low-, middle-, and high- skill jobs in a rural county in East Tennessee to create an example of a small town workforce. For this study, technology included computers, robotics, and mobile technology. A survey determined the technology used, training provided, salaries, and job skill levels based on education obtained and required by major employers. The study identified the level of jobs requiring more technology skills and salaries or training related to these job skill levels. Participants included 336 persons who completed an electronic survey. Participants represented twenty-eight different companies in healthcare, education, manufacturing, banking, and other small businesses in an East Tennessee rural county.

The major findings of the study included: a) use of multiple forms of technology in all job skill levels; b) more time spent in on-the-job training for higher job skill levels; c) participants in lower job skill levels more likely to be overqualified for their position; d) participants in higher paying jobs used more types of technology; and e) participants in higher skill level jobs tend to have higher salaries. The study concluded that, while technology affected all skill levels, there was a significantly positive relationship between salary, technology use, technology training, and job skill level.

DEDICATION

This work is dedicated to my husband and children who have given the greatest sacrifice. To my loving and supportive husband, Scott, who has encouraged me and kept me sane while I finished yet another degree. You have kept our home in order and I look forward to being by your side instead of in the other room on the computer. To my children, Mollie and Josh, who have been so patient over the years. I look forward to playing games, watching movies, going places and spending more time with you as you blossom into young adults. I hope seeing my work and dedication inspires you to follow your dreams without hesitation of any challenge in life. You make me very proud. Thank you to each of you for your love.

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CHAPTER 1

INTRODUCTION

Technology has grown in personal use and in the workplace for many years. “You do not have to look far to find evidence that technology plays a growing role in our lives” (Colbert, Yee, & George, 2016, p. 731). According to Internet Live Stats (2018), over 400 million people, or 6.8% of the population, used the Internet in 2001. By 2005, user numbers reached over one billion and over two billion by 2010. Over 40% of the population (almost 3 billion people) used the Internet in 2014. By 2017, those numbers increased to over four billion with more than ninety-five percent of North Americans using the Internet (Internet World Stats, 2018). This access to technology changed the workplace, not just in the office but on the production floor as well. In an earlier study, Osterman and Weaver (2013) conducted a national survey of manufacturers to determine the skills required of main production workers, which represents about 70 percent of manufacturing employees. Sixty-two percent of manufacturing employers required basic computer usage at least weekly, while forty-two percent required basic word processing and the ability to search the Internet for information (Osterman & Weaver, 2013, 2017). “More advanced skills such as the use of engineering software and computer-aided design for manufacturing were required by twenty-eight and twenty-nine percent of employers,” respectively (Osterman & Weaver, 2013, p. 5). Weaver and Osterman (2017) also studied skill gaps in regard to hiring versus employer skill demands among manufacturing companies. Traditional skills of physical strength were no longer enough; workers also needed basic academic skills including technology. In addition to reading and writing ability, the manufacturing industry sought computer and math skills with only fifty-three percent requiring extended reading ability (Osterman & Weaver, 2013; Weaver & Osterman, 2017). "Demand for basic levels of math, reading, and computer skill is widespread. Requirements for extended reading and computer abilities, in particular, are common, encompassing more than half of all manufacturing establishments" (Weaver & Osterman, 2017, p. 287). Many jobs, including manufacturing, require basic skills including technology skills.

The modern work environment differs from that of previous generations and will likely change for the next generation. Technology has impacted the world and workplace through such channels as electronic mail, automated systems, social media, and mobile technology, among others. "Employees have a world of information at their fingertips, can collaborate with colleagues across the globe, and can deliver products increasing capabilities at decreasing costs" (Colbert, Yee, & George, 2016, p. 734). These improvements in technology may come with a cost or learning curve for employers and employees. Weaver (2017) stated that "information technology has hit American firms like a whirlwind, intensifying demand for technical skills and leaving unprepared American workers in the dust" (p. 76). The ever-changing technology in people's daily lives and in the work place has had an impact on the workforce and the need for technology training.

Technology affects various types of industries. "Manufacturing requires analytics and programming. Farming is a mechanized, globalized industry with environmental, economic, and marketing concerns that would stagger a 19th-century grower. The world changes, and changes again" (Spellings, 2018, p. 1). In 2016, the Labor and Economic Analysis Division (LEAD) of the North Carolina Department of Commerce and the NCWorks Commission conducted a survey of 1,900 establishments of all sizes across the state of North Carolina. The employer-needs survey focused on hiring difficulties, recruitment and retention practices with emphasis on

Manufacturing, Construction, Health Care & Social Assistance (Health Care), as well as STEM (Science, Technology, Engineering, and Mathematics) related industries (NCWorks, 2016). The NCWorks (2016) report on the LEAD survey for North Carolina stated key findings that included forty percent of employers with difficulties hiring qualified individuals for at least one position and more than half citing lack of technical skills as one of the top three reasons for those difficulties. Other issues included work experience, education, and soft skills. "Of these industry-specific samples, a lack of technical skills was one of the top two concerns for each type of employer" (p. 10). However, technical skills in that survey could also be occupation-based skills as opposed to technology skills.

Rampey et al.'s (2016) analysis of the Organization for Economic Cooperation and Development's Program for the International Assessment of Adult Competencies (PIACC) focused on literacy, numeracy and problem solving in technology rich environments in young adults aged 16-34 in the United States. The researchers found a relationship between educational performances among the three domains. In general, young adults completing a higher level of education were more proficient in basic academics as well as problem solving in technology-rich environments. Rampey et al. (2016) also determined that:

> Digital technology has revolutionized access to information and communication capabilities over the past two decades. In particular, the Internet has increased instantaneous access to large amounts of information and has expanded instant voice, text, and graphics capabilities across the globe. (p. B-9)

It is necessary to understand how to function in these technology enhanced environments. Knowledge of drop down menus, command names and web page links is required. As well, Rampey et al. (2016) noted the importance of "the ability to interact effectively with digital information; understand electronic texts, images, graphics, and numerical data; and locate, evaluate, and critically judge the validity, accuracy, and appropriateness of the accessed information" (p. B-9). The Rampey et al. (2016) analysis concluded that technology skills were imperative for problem solving in technology-rich environments.

> Items for this domain present tasks of varying difficulty in simulated software applications using commands and functions commonly found in e-mail, web pages, and spreadsheets. These tasks range from purchasing particular goods or services online and finding interactive health information to managing personal information and business finances. (p. B-9)

These findings demonstrate how much technology is being used as well as how the use of technology enhances simple every-day tasks found in the workplace. The ability to function in a technology rich environment is important.

Technology skills are not emphasized in schools as much as reading and math are, but they are often a product of experience. Even though educators teach with technology, students, particularly millennials, may have a better understanding of technology than their teachers do. Students use technology in and out of the classroom (McIntosh, 2013). The fastest way to middle class used to be through labor and workforce (McIntosh, 2013). This has been "replaced by a generation that looks at being technologically savvy and ambitious as their focus, rather than job placement and career" (p. 43). Combining technology skills with academics may the combination needed for the future of workforce and education.

The state of Tennessee is attempting to address this problem by offering more affordable options for higher education. Beginning in 2014, the State of Tennessee issued a higher education attainment mission, Drive to 55, which proposed to equip 55 percent of the population in Tennessee with a college degree or certificate by the year 2025 (Tennessee, 2014). One goal of Drive to 55 was to close the skills gap in Tennessee's workforce (Tennessee Achieves, 2019), which included the frequent request for the ability to use technology (Weaver & Osterman, 2017).

Statement of the Problem

According to Taraman (2010), "Today, nearly 30 percent of workers with science and engineering degrees are age 50 and older" (p. 32). Their replacements will likely be using more technology. Students and potential workers may need to know how much technology is being used in the work place in order to best prepare for the workforce.

Rob Barger (personal communication, November 23, 2016), Chairman of the Claiborne County Economic and Community Development Board, noted the six top manufacturing companies in the county employed over 2,800 people with an expected increase of 430 jobs by 2021. The United States Census Bureau (2015) reported only 420 employers and 7,366 employees in Claiborne County in 2015, which indicated those six manufacturing industries employed almost 40% of the workers in Claiborne County (cited in United States Department of Commerce, 2017). Employers from these growing manufacturing companies were asked to participate in this study along with companies from the education, banking, and healthcare fields.

This study not only investigates the use of technology but also the education levels required and attained by employees in the three job skill levels. The Tennessee Higher Education Commission (2017) reported only 19% of the population in Claiborne County had a certificate or degree above a high school diploma. This study may help put these numbers into perspective. The success of the economy has always depended on a well-trained workforce, however as technology changes so does the need for training (Carruth & Carruth, 2013). In Tennessee, multiple groups and organizations work toward filling the gap between education and the needs of the workforce. It is important that our students and potential workers be prepared for the requirements of the 21st century work place (Tucker, 2014).

As students and potential workers decide how best to prepare for the workforce, it would be helpful to know whether technological training would make a difference in the types of jobs and potential salaries available. Consequently, the purpose of the current non-experimental, quantitative study is to examine the technological knowledge and skills required of employees in Claiborne County, Tennessee compared by different job skill levels. A survey determined the technology use, salary levels, and training provided by major employers in Claiborne County. This survey could serve as an example of a small-town workforce and aid identification of potential skill gaps and relationships between skill levels, education, and salaries. This study may also identify the amount of training and skills needed to fulfill technologically advanced jobs and indicate the possible advantages of higher skill levels. For the purposes of this study, technologically advanced jobs included those requiring multiple types of technology, such as automation, digital devices, software, and communication and information tools, such as email and the Internet (Autor, 2015; Purcell & Rainie, 2014; Rampey et al., 2016).

Research Questions

In order to determine if there is a significant relationship between technology use and training, salary levels, and job skill levels, the study examined five research questions.

RQ1. Is there a significant difference in the number of different types of technology used between employees in low-, middle-, and high- skill jobs?

RQ2. Is there a significant relationship between the amount of technology training required for employees and their job skill levels (low, middle, or high)?

RQ3. Is there a significant relationship between employee level of education and job skill level (low, middle-, or high)?

RQ4. Is there a significant relationship between pay and number of different types of technology used by employees?

RQ5. Is there a significant relationship between pay and employee job skill level (low-middle, or high)?

Significance of Study

This non-experimental quantitative study was designed to examine the technological knowledge and skill requirements of employees in Claiborne County, TN when comparing technology needs and uses by different job skill levels. This study was designed to help inform potential employees, high school counselors, institutions of higher education, and employers of the current status of the use of technology and its relationship to training, salaries, and education in small rural areas.

Educational institutions, training facilities, employers, and potential employees can benefit from understanding the potential skills gaps and their association with changes in technology. Additionally, information on salaries, on-the-job training and credentialing can be beneficial to students, potential employees and academic advisors.

Definitions of Terms

Skill levels used in this study are based on those defined throughout the literature based on educational levels as opposed to specific skill levels. For the purposes of this study, the following definitions apply:

High-skills jobs. These jobs require at least four years of higher education (Achieve, 2012). Rothwell (2016) referred to this category as skilled professional work, which, in addition to a four-year degree required “a higher cognitive math skill” (p. 48).

Low-skills jobs. These jobs require no more than a high school diploma (Achieve, 2012). “Low skilled jobs are generally considered as those requiring no more than a high school education and not more than one year of experience. Low-skilled jobs may require on-the-job-training but associated skills can be fully learned within 30 days” (Stark & Poppler, 2016, p. 17).

Middle-skills jobs. These jobs require more than a high school diploma and less than a four-year degree in higher education (Achieve, 2012). Middle-skills jobs are also referred to as skilled technical workers (Rothwell, 2016).

Technology. This is defined as digital devices and applications, communication tools, and networks used to acquire and evaluate information, including mobile technology and automation tools (OECD, 2012; Rampey et al., 2016).

Limitations and Delimitations

Certain limitations may exist regarding this study due to the nature of the population being broad and voluntary. However, one can assume that the survey was valid and reliable, participants responded thoughtfully and honestly, and the sample represents the population.

The study was delimited to employees in low-, middle- and high-skilled jobs in Claiborne County in the southeastern United States. The study was also delimited to participants who agreed to participate or could participate based on their employers' views. For example, some manufacturing companies did not allow all employees to participate or limited participation to those with certain jobs or emails. Thus, the responses of those who chose to participate might vary from those who chose not to participate. The results of this study may not necessarily be generalized to other geographic areas or forms of employment. Each geographic area is unique in its demographics and needs.

Overview of Study

This research study is arranged into five chapters. Chapter 1 offered an introduction, statement of problem, research questions, the significance of the study, definitions of key terms, and overview of the study. Chapter 2 will include a review of literature for education, salaries, and the use of technology in the workforce. Chapter 3 covers the methodology of the study including instrumentation, population and sample, data collection and data analysis. Chapter 4 presents the results of the analysis. Chapter 5 consists of a summary and discussion of findings, conclusions of the study, as well as recommendations for practice and further research.

CHAPTER 2

LITERATURE REVIEW

The search for information has moved from the encyclopedia to the Internet with technology advancing daily the United States (Kaminski, Switzer, & Gloeckner, 2009, p. 228). According to Tucker (2014), “Students in this era have grown up with access to the Internet and are capable of interacting and collaborating in ways that were unfathomable at one point in time” (p. 168). Citing findings from Pew surveys, Duggan (2015) noted that 85% of U.S. adults searched the Internet and 67% used smart phones; however, some adults had limited access to the Internet, using only smartphones or laptops (Sparks, Katz, & Beile, 2016). According to Smith (2015), another Pew survey in 2015 found that “nearly two-thirds of Americans own a smartphone, and 19% of Americans rely to some degree on a smartphone for accessing online services and information” (p. 1), including 15% of adults aged 18-29. The growth in accessing information online flowed into the workplace as well. American jobs are now infiltrated with the internet and cell phones transforming the American workplace with digital (Purcell & Rainie, 2014). A 2013 survey of employed Internet users revealed that 94% of jobholders from technology companies to non-technology firms were Internet users (Purcell & Rainie, 2014).

According to DeSilver (2016), citing a study by the Pew Research Center, a trend shows Americans delaying retirement with over 18% over the age of 64 still working in May 2016. The study also revealed that “older workers are more likely to be in management, legal and community/social service occupations than the overall workforce, and less likely to be in computer and mathematical, food preparation, and construction-related occupations” (DeSilver, 2016, p. 4). The Bureau of Labor Statistics projected that, by 2022, almost 32% of older Americans would still be employed (Toossi, 2013). Toossi’s projections of changes in the labor force were based in part on the baby-boom generation approaching retirement age. The workforce is changing. There was a peak in 1999 of women entering the workforce and the projected rate of participation in most of the “age, gender, and racial and ethnic groups are projected to decrease or, at best, remain flat over the next 10 years” (Toossi, 2013, p. 31).

Mirvis, Sales, and Hackett (1991) examined the impact of new technology during the time when computers first entered the workplace. At that time, they estimated that over two-thirds of US workers in technical, managerial, and administrative positions were using computers on the job. Mirvis, Sales, and Hackett (1991) found that three-fourths of the companies had been working to computerize their companies for the change in technology of the 1990’s. The process and concerns with implementing new innovative technology in the workplace requires ongoing training, more so than previous years (Carruth & Carruth, 2013).

Blankenau and Cassou (2011) suggested that the use of technology in the workforce is “widespread and is found in nearly every industry. However, the pace of this change differs considerably by industry and even within industry groupings” (p. 3140). They found that skilled services or high-skilled jobs and manufacturing experienced the most rapid change, while low-skilled positions saw less change produced by technology. The current study focuses on which skill level jobs experience change due to technology in Claiborne County.

Watson (2017) found that the majority (64%) of occupations in 2016 required no more than a high school diploma as the entry level of education. Only 25% of occupations required a Bachelor’s degree or above. However, from May 2007 to May 2016, the occupations requiring no more than a high school diploma fell by nearly 2.6%, while those requiring postsecondary credentials rose by 2.3%. Watson (2017) predicted that occupations requiring entry education in the middle-skill range (more than a high school diploma but less than a four year degree) were expected to grow more rapidly than occupations with lower entry education from 2014-2024 and occupations requiring a Master's degree would have the fastest growth.

Tennessee's Drive to 55

The State of Tennessee has an initiative in place for 55% of its population to possess a postsecondary degree or certificate by 2025. To reach this goal, the State implemented funding for higher education through programs like TNPromise, TNAchieves, and TNReconnect. These programs offer last dollar funding, meaning after all other grants and scholarships are applied, for tuition at technical and community colleges and encourage citizens to continue their education beyond high school (TNAchieves, 2016). The Tennessee Higher Education Commission published the document *Postsecondary Attainment in the Decade of Decision: The Master Plan for Tennessee Postsecondary Education 2015-2025*, which outlined a plan to ensure attainment of the Governor's Drive to 55 goal or 55 percent educational attainment by 2025 (Tennessee Higher Education Commission [THEC], n.d). Tennessee Promise and Reconnect emphasize community colleges and technical centers, which allows students an opportunity to attain a degree and enter the workforce within two years. "This Plan identifies three groups of individuals as focus populations for the outcomes-based formula, the Quality Assurance Funding program and the other targeted initiatives" (THEC, n.d., p. 18). Adult learners, low-income students, and academically underprepared students are the three foci for the outcomes-based incentive plan. These three focus area populations are critical for the success of the initiative but often face the greatest challenges in higher education. Tennessee has 13 community colleges and 27 colleges of applied technology (THEC, n.d.). Qualified Tennessee residents can take advantage of a last-dollar scholarship at these institutions through the scholarship and mentoring program known as Tennessee Promise. Tennessee Promise offers all current high school graduates an opportunity to attend college. More importantly, it provides eligibility awareness for students who may not normally apply for college, illustrating that they too can attend college in Tennessee. Many of these students are low-income, first generation students who are eligible for Pell grants and benefit from the mentoring component of the program. The concept that anyone can go to college not only opens doors for low-income, first generation students but also for those who may struggle academically. The institutions receiving the academically unprepared students added more remedial courses and vamped up their Student Services areas to support the students who might not have otherwise attended college. In addition, Tennessee Reconnect extends the programs and funding for recent high school graduates participating in Tennessee Promise to residents deemed by FAFSA as an independent student (including being at least 24 years of age or married) who want to pursue a postsecondary degree or credentials up to an associate's level (Tennessee, 2019).

Tennessee Reconnect is part of Tennessee's Drive to 55 initiative for 55% of the state population to complete an Associate's degree or certificate above high school by the year 2025 (Santhanam, 2017). "Some 900,000 adults with some college but no degree reside in the state, and it will be impossible to achieve the mission of the Drive to 55 without re-engaging these students and helping them finish their degree or certificate" (THEC, n.d., p. 26). Many community colleges and Tennessee Colleges of Applied Technology advertised and piloted programs for adult learners prior to the official implementation of the policy in Fall 2018 (Faris, 2017).

Tennessee Promise and Tennessee Reconnect create awareness of a college degree option among high school seniors and adults. Tennessee Promise incentivizes institutions to focus on first generation students, while Tennessee Reconnect addresses a greater number of the population by including adult learners (Tennessee, 2014; Tennessee Reconnect, 2017). These programs not only heavily impact community colleges, like the Claiborne County campus of Walters State Community College, but also create a large population of potential students in Tennessee (Tennessee, 2014; Tennessee Reconnect, 2017). Occupational Employment Statistics data showed that, in May 2016, over 63% of employment in the United States had a typical entry-level education requirement of a high school diploma or less, while over 36% required some postsecondary education with over 25% requiring a Bachelor’s degree or higher. The U.S. Bureau of Labor Statistics (2017) projected a shift in those numbers by 2024 with the fastest growth in occupations requiring a Master’s degree, almost 21% requiring between a high school diploma and bachelor’s degree, and fewer than 11% requiring only a high school diploma or less. According to the Tennessee Higher Education Commission (2019), only 21.9% of the population in Claiborne County held a certificate or degree above a high school diploma. Tennessee’s Drive to 55 gives students in Tennessee hope of obtaining certificates, degrees, and skill sets to prepare them for jobs requiring higher skills.

Skills Levels and Salaries

Prior scholars classified occupations by skill levels, such as high-skill, low-skill, or middle-skill jobs. According to Stone, Blackman and Lewis (2010), the phrases “high skill, high wage” suggested technology-driven occupations that required a Baccalaureate degree or higher and defined high wage as annual salary between $30,000 and $40,000 or anything above the median income level for all occupations. The researchers further suggested that middle-skill jobs required students to earn at least a high school diploma with additional training in their field

(Stone et al., 2010). “High-skill occupations are those in the professional/technical and managerial categories. Low-skill occupations are in the traditional, in-person service and agricultural categories” (Stone et al., p. 23). Most jobs fall into the middle-skills category, earning a median hourly wage (Stone et al., 2010). Blankenau and Cassou (2011) excluded middle-skills individuals from their study but considered “individuals with 12 or fewer years of school as unskilled and individuals with 16 or more years of school as skilled” (p. 3132).

Students may assume they can graduate from high school, get a great job, work hard, and support a family. However, according to the *Pathways to Prosperity Report* (Jobs for the Future, 2014):

> Millions of young Americans are stepping into the labor market after high school only to discover that the best they can do is to piece together a series of part-time, low-wage jobs that barely allows them to support themselves, much less build a satisfying life. (p. 4)

Even middle-skill jobs with median wages often require some training after high school. Paul and Siegel (2001) found that many of the labor reductions due to outsourcing, trade, and advancing technology were among these low-skilled positions that required workers with only a high school diploma. According to their findings, “technological factors, especially computers, have the largest impact on high-school graduates” (p. 251). Paul and Siegel also examined the impact of technology on the trade industry and the workers they hired, discovering that many labor industries recruited workers straight out of high school. They noted that low-skilled jobs, especially those requiring only a high school diploma, were most at risk from external factors, while higher skilled jobs, requiring at least some college, benefitted from trade and technical changes. In other words, the higher paying jobs that required more technical skills in the manufacturing industry might also require some college and might be more stable in an ever-changing economy. Students in colleges and technical schools need this information when making career choices.

Singh (2017) studied starting salaries of students entering the workforce and found it was not only their major or skill level that made a difference. She looked at starting salaries among the graduating classes of 2013-2016 from Purdue University, and found that internship experience, GPA, and type of school attended significantly impacted starting salaries. In other words, it was not only the school or area of study that affected starting salary but also students' activity during their college years. In addition, Deming (2016) examined employers' perceptions of the value of higher education from different types of institutions. The researcher compared types of schools attended to determine whether employers showed preference when giving call-backs to job applications. This research compared large online for-profit institutions to non-selective public schools, and smaller brick and mortar private schools to public institutions. The "results suggest that employers value bachelor's degrees and certificates from public institutions more highly than they do those from for-profit institutions" (p. 6). Consequently, there are several contributing factors to starting salaries and employers interest in prospective workers.

Technological advancements over time produced a real change in the workforce. Paul and Siegel (2001) found

> In the 1973-1989 time period, for example, automation/computerization appears to explain 78 percent of the employment changes for high school graduates, and 65 percent for those with some college . . . (they) found (in their study) that technology has a stronger impact on shifts in labor composition in favor of highly educated workers than trade or outsourcing. An increase in investment in

> computer and R&D simultaneously reduces the demand for workers without a college degree and increases the demand for workers with at least some college. (p. 259)

In the 1970's and 1980's computers were the emerging technology of their time, today, it may be mobile devices, cell phones or robotics. Each introduction of technology increases the demand for training and higher education including technology skills.

Afxentiou and Kutasovic (2011) also studied the gap in wages, or polarization, between different skill levels. "From 1980 to 1987, wages increased across all income classes, but inequality rose. The wage distribution widened as wages in the high-income group grew the fastest, middle groups grew at a slower rate and the bottom grew the least" (p. 50). Autor, Katz, and Kearney (2008) had similar findings for wages of different skill levels in the 1990s, with high-skilled and low-skilled wages increasing, and middle-skilled wages remaining about the same. Moretti (2013) also found that wages between 1980 and 2000 increased by 20% more for college educated workers than they did for those with only a high school diploma. However, it was found that college graduates were more likely to live in larger cities where the demand for skilled workers was higher. Moretti also noted that the demand for higher skilled workers included "skill-biased technical change" (p. 65). Afxentiou and Kutasovic (2011) concluded from the study, which continued into 2004, that "the wage gap between high-skill and middle-skill workers has widened while the wage gap between middle- and low-skill workers narrowed" (p. 63). Regardless of the era or the direction of middle-skilled jobs, the situation for persons with higher skilled, higher wage jobs seemed to improve, while the lower skilled, lower wage jobs did not.

Educating the Skills Levels

One way to help ensure employees have proper training and preparation to work is for higher education to communicate with local industry to discuss specific needs for employment and prepare their students accordingly. "Institutions of higher learning are justly concerned and many are seeking ways to demonstrate the readiness of their graduates" (Kaminski, Switzer, & Gloeckner, 2009, p. 228). The purpose of their study was to determine whether there was a change in perception about information technology in graduating seniors in a mid-sized research-one institution, and opinions from freshmen from five years earlier. One recommendation from this study was to begin working toward fluency in information technology education earlier in the educational process, even in high school. Currently, it is safe to assume that children have access to computers starting in elementary school; however, the Kaminski et al. study recommended access and fluency years before computers were in some elementary schools. They noted that "their respondents indicated they have the most confidence in their presentation software (such as PowerPoint) skills" (p. 232) over spreadsheets and creating graphics or video/audio software. According to Hendrick and Raspiller (2011), high employee attrition rates can be attributed to hiring individuals without the skills and values required for the job. Human resource (HR) managers play an important role in hiring individuals with appropriate skills.

Leffakis and Waldeck (2007) studied the human resource managers' role in implementing advanced manufacturing technology (AMT). Human resource managers must understand the inner workings of the company if they are going to hire appropriate employees. Their study concluded that "HR managerial perceptions are at the center . . . of the implementation of AMTs . . . and highlights the advantages HR managers have in regard to workforce development in an AMT environment that provides computerized support to skilled workers" (p. 7). The results emphasized the need for HR manger's perception of plant needs, including basic technologies. This relationship is important for "worker reskilling in response to technology-driven workers and organizational needs" (p. 9). HR managers are the link between potential employees and the needs of the company.

American Workforce

Today's workforce has evolved in large part due to technology. Over the past few years, automation and outsourcing to other countries replaced workers, and the skills needed for the majority of jobs changed. According to a study by Achieve Inc. (2012), "Historically, (middle skills) jobs were available to those with a high school diploma (sometimes less), but changes in production and increasingly sophisticated technology now requires more education and preparation for jobs than ever before" (p. 4). The labor supply for middle skills jobs needs growth, which increases the need for education and training for potential and current workers. According to Achieve, Inc. (2012), middle skills jobs were "those jobs that now (compared to decades past) require more than a high school education but less than a bachelor's degree (e.g., associate degree, postsecondary certificate, apprenticeship, etc.)" (p. 2). According to the United States Department of Labor (2016), the national unemployment rate in October 2016 was 4.9%, compared to 4.8% for Tennessee and 6.4% for Claiborne County. According to Achieve, Inc. (2012), in 2012, middle skills jobs comprised about half of all U.S. jobs. Those jobs "generally offer solid wages and pathways to advancement, and in many cases, are going unfilled even as overall unemployment remains high" (Achieve, 2012, p. 2), and may be unfilled due to lack of training and education of the applicants. The Achieve, Inc. (2012) report predicted that 78 percent of all available jobs and 63 percent of all jobs would require post-secondary education and training by 2018. Holzer and Lerman (2009) predicted that, by 2019, only 33 percent of job openings would be high skilled jobs, 45 percent would be middle skilled jobs, while 22 percent would be low skilled jobs.

Bevins, Carter, Jones, Moye, and Ritz (2012) also illustrated the need for and relevance of innovation and technology in the future workforce, specifically noting concern for narrowing the skills gap among current workers. There is a need to develop training to accommodate the needs of 21st century industry. Bevins et al. (2012) suggested that “the future will require workers to be lifelong learners with the ability to adjust and adapt to continuously changing markets” (p. 9).

Human resource agents need to know that potential employees have the needed skills to do the job. They look for individuals who already have the skills needed for the job (Hendrick & Raspiller, 2011). Companies cannot afford to hire the wrong people for the job. Childress (2012) pointed out that “cutting labor costs has the same effect as increasing productivity” (p. 26). Therefore, increasing labor costs, through hiring and training, has the same effect as decreasing productivity and losing money. Blecher (2001) stated that the “average hiring mistake costs $17,000 to $20,000, including the expense of finding and retraining a new employee” (p. 1). Situational interviews or asking for a sample of applicants’ work or demonstration of their ability during the hiring process makes sense. Pentittila (2004) offered an example of an applicant being asked to develop and lead a partnership strategy session, which was a skill required for the job.

Educating the Workforce

Many organizations are addressing the need to educate the workforce to meet the demands of the future. “While successful economics have always depended on a skilled and knowledgeable workforce, today’s rate of change in production processes and workplace technology is requiring more ongoing training and retraining than in previous years” (Carruth & Carruth, 2013, p. 514). Multiple groups and organizations work toward filling the gap between education and the needs of the workforce. For example, Partnership for 21st Century Skills (P21) “works on closing the gap between knowledge and skills that most students learn in school and the skill and knowledge needed in 21st century workplaces” (Tucker, 2014, p. 167). It is important for students to master 21st century skill in order to be successful in the workplace (Tucker, 2014). In addition, Beyond Current Horizons, commissioned in 2007 by the Technology Futures Unit of the UK’s Department of Children, Schools and Families, created a long-range plan in the UK for technological change and the effect on new industries and other working employment to the year 2025 (Facer & Sandford, 2010).

Private organizations across the country are taking note of the current educational level of Americans. According to Kolb (2011),

> America no longer leads the world in the percentage of our population with college degrees . . . Several major private foundations have responded by launching their own college-completion goals. The Bill and Melinda Gates Foundation is supporting efforts to double the number of degrees and certificates awarded to low-income young adults, and the Lumina Foundation wants to increase the proportion of 25-to-64-year-olds with high quality degrees and

credentials to 60 percent by 2025. Several non-profit organizations have also joined this effort to lift the level of educational attainment. (p. 14)

Organizations also reach out to industries and educators to prepare the future workforce. For example, the Society of Manufacturing Engineers (SME) Education Foundation provides grants for manufacturing education to help prepare tomorrow's engineers for the technical and business demands of the 21st century. The SME is in the middle of nearly a 30-year plan to help close the gap between predicted worker shortages and technical education. SME posits if they are successful at "encouraging young people to pursue manufacturing engineering careers . . . they will be better able to align themselves with emerging technologies and the skilled, high-demand jobs that industry has told (them) it will need" (Taraman, 2010, p. 31). The computer-aided design and manufacturing programs used in industry requires higher level computer skills in addition to the traditional manual labor skills (Pathways to Prosperity, 2014).

All types of jobs, including educators, require more training and education. "Creating programs that promote technology integration in the classroom and giving teachers the support, training, and professional development opportunities they need could be a step in the right direction toward successful technology integration" (Tweed, 2013, p. 86). Taraman (2010) added that "technology has been found to be the leading contributor to productivity improvements" (p.32). Taraman found that development and research of technology today is at much greater pace than years past. Educators have a difficult time keeping up with current advances in technology in order to use it in their classrooms and curriculum (Taraman, 2010).

Lohrenz (2014) discussed the need for skilled and technologically competent workers in the marine science and technology sectors. He pointed out the need for technology training due to the explosive growth in advanced instrumentation and data collection. It is important to prepare a potential workforce with the skills needed for future demands of that workforce. He predicted a growth in marine jobs and suspected a challenge in retaining qualified personnel as well as recruiting and hiring new personnel in the field of marine science and other technology driven disciplines (Lohrenz, 2014).

Barrett (2014) found that students see college as a step toward a meaningful career, while hiring professionals see a degree as a fulfillment to a requirement. Barrett (2014) investigated how those hiring individuals with a liberal arts degree perceived the value of a liberal arts degree compared to that of the students. Barret found that those with a college degree were more likely to demonstrate the drive to succeed and possess the professional qualities recruiters and hiring professionals are seeking. Medellin (2014) examined longitudinal data to study the "relationships between college student employment, bachelor's degree completion, and post-college salary outcomes" (p. 3). Medellin's results in his study of students' chance of college completion suggest, "living on-campus, active engagement in clubs, study groups, and interaction with faculty are positively associated with degree completion" (p. 105). Medellin also found a positive correlation between degree completion and students working up to 20 hours per week, however, working more than 30 hours per week had a negative impact on student success and post-college financial outcomes. Singh (2017) also found a moderate increase in salary with an increase in the number of internships in which a student participated. Students should know that the completion of a degree or certificate, regardless of the field, sends a message to potential employers that they are not only educated but able to complete a program. Barrett (2014) found that hiring professionals are looking for a candidate with the motivation to succeed, which is most often found in those who have completed a college degree. Barrett (2014) suggests that college advisors can relieve some stress for students by conveying that there are many critical parts to resume in addition to their choice of major.

eLearning as an Educational Tool

One popular form of educational training that incorporates technology into the course format is e-learning. Carruth and Carruth (2013) defined e-learning as “education training which takes place partially or entirely over the [I]nternet” (p. 513). This platform for learning requires student competence in some forms of technology and may prove a more accessible training style for workforce training, especially in terms of continuing education (p. 515). Considering the changes in the workforce due to technology, potential workers are expected to have the skills required for the technological challenges presented (Li, von Davier, & Hancock, 2016)

The workforce today expects graduates to use current technology. Thus, college graduates should have exposure to the latest technology, experience Web-based technology, and demonstrate proficiency in basic computer skills. The most common way students gain exposure to technology is through Web-based programs. Many colleges and universities use a Web-based application, admissions, and registration process as well as Web-based learning management systems. Desire2Learn/Brightspace is an example of a learning management system used in Tennessee. Students can find their syllabus, course materials, news items, quizzes, discussion boards, and drop boxes in this system. The extent to which students must use this system varies by school and instructor. Online and hybrid students will obviously use the system more than will students in face-to-face classes. As mentioned, there is a push from Tennessee’s governor to complete the Drive to 55 initiative, wherein fifty-five percent of the Tennessee population will hold at least a two-year postsecondary degree by the year 2025 (Tennessee Higher Education Commission, n.d).

Global Impact of Technology in the Workforce

Changes in technology are not only a trend in the United States; they produce a global impact. Historically, the Russian school system taught courses in labor force or work ethic; however, the more recent trend has been to replace this training with training in technology skills (Sasova, 2011). Seena and Sudhier (2014) found that librarians from the University of Kerala preferred using lower levels of technology and needed training in information and communication technology to assist them in the skills needed for their jobs. Due to changes in the information and communication technology affecting the traditional concept of library professional's duties, Seena and Sudhier looked specifically at Web 2.0 technologies and studied the impact of those applications for library professionals. Their findings suggested that "The LIS professionals should be provided with the training for online communication tools (blog, podcast, wikis, RSS, content management, etc.) to make them confident users. This also empowers librarians with high specialized knowledge and skills" (p. 424). Recommendations were made for available funding for training, infrastructure and resource development, policy review, and professional support. Librarians, as well as faculty, are resources for the students and need to have the skills to assist students with assignments and to create lessons that include the necessary technology. Similarly, Seena and Sudhier (2014) concluded that modern and traditional knowledge and applications should be combined to form a new curriculum in the field of information science in higher education. There seems to be an overall consensus in the literature about the value of technology courses in higher education.

According to Bevins et al (2012), “Asian countries (in particular China and India) are rising to the top in terms of economic stability, growth, and leadership. Because of new and improved technology and innovations, their product and labor markets have increased in both size and competitiveness” (p. 8). Bevins agreed with other literature that technological literacy needs to be “embedded in all facets of our education and economy” (p. 12).

Technology in the Workforce

Childress (2012) studied the trend in manufacturing jobs based on the economy and the threat of foreign competition because automation, quality, and efficiency associated with technology may impact jobs in the United States. According to Childress (2012), “automated production tooling is able to sense input and react accordingly . . . automation causes a reduction in the number of mistakes made in production and helps to reduce labor costs” (p. 27). Childress suggested that the number of manufacturing workers is decreasing but the skill level of workers is increasing. There is an increasing demand for mechanical engineers and technicians who are able to set up, program, control, and maintain the automation systems.

Childress (2012) focused on the technological impact on manufacturing. One question asked in that study was “how have more developed, high-wage countries, such as the U.S., adapted to increased global competition? It appears that U.S. manufacturers have improved productivity through technological and managerial innovations while simultaneously reducing the size of the manufacturing workforce” (p.25). Wages and hiring costs are important factors and expenses for manufacturing companies. Higher skill levels require higer wages and benefits which are among the major costs of a manufacturer’s budget (Childress, 2012). Automation or technology in the manufacturing industries appear to be cost saving advancements.

Others studied the field of manufacturing and changes in technology skills. For example, Graetz and Michael (2016) analyzed the impact of robotics on manufacturing. The fourteen year study revealed an increase in labor productivity with the use of industrial robots as well as, an increase in wages and a reduction in output prices, benefiting employees and employers. Unfortunately, however, the robotics contribution to economic growth may be at the cost of low-skilled workers. On the other hand, Andes and Muro (2015) concluded from Graetz and Michaels' research that robotics are not necessarily the cause for lost jobs because there was too much variation in the results and the impact was not as extreme as expected. Lawson (2010) also studied the impact of automation in manufacturing plants. Lawson found that all sized companies made an effort, such as providing formal training, to retain employees when introducing automation. Autor (2015), on the other hand, looked at the future of automation from a historical point of view. He suggested that "even if automation does not reduce the quantity of jobs, it may greatly affect the qualities of jobs available" (p. 9). He suggested that middle-skills jobs would continue to grow but questioned the ability of the US education system to provide the training system required to maintain the number and quality of workers needed in future middle-skill jobs. According to Kazis and Molina (2016), "In 2013, 15.2 million people in the United States worked in retail, accounting for about 10 percent of the nation's jobs" (p. 1). These jobs are mostly entry level, low wage positions.

Sundberg et al. (2011) studied disconnects between graduate students and prospective employers and concluded that STEM (science, technology, engineering, mathematic) education in the United States requires leaders in higher education and leaders in the workforce (private, non-proffit, and government) to collaborate in order to identify skill required for future scientists and training or curriculum needed to prepare students for the workforce. Sundberg et al. noted collaboration is key for the success of STEM programs. Educators and students often feel as though they have prepared for the workforce when, in reality, they have not. For example, surveys of graduate students, faculty, and potential employers in the field of botany found that graduate students and potential employers did not agree on strengths and weaknesses of the students concerning their preparedness and technology skills (Sundberg et al., 2011). The field of education is another profession heavily impacted by technology. Tweed (2013) found “that the self-efficacy of a teacher is significantly positively related to classroom technology use” (p. 78) and recommended more training opportunities for teachers.

There is growth in workforce opportunities in technology. “Occupations in the science, technology, engineering and mathematics (STEM) fields . . . are expected to grow at a rate of 17% while non-STEM jobs will grow at a rate of 10% by 2018” (Achieve, 2012, p. 17). On the other hand, half of all STEM jobs do not require a four-year college degree and pay ten percent higher than jobs with similar educational requirements. Twenty percent of all jobs require some knowledge in one of the STEM fields (Brookings Institution, 2013; Jobs for the Future, 2014).

Banking and accounting are other fields seeing growth and change due to technology. Fung (2008) researched the way in which technology could improve efficiency in the banking industry. Fung found that banking organizations “can be improved by substituting technology resources for human resources in the production of banking services until the costs of doing so outweigh the diminishing returns” (p. 89). Technology affects our labor force. Fung (2006) discussed the ways in which technology lowered the number of employees needed in banking since the 1990s. The 1990’s required the banking industry to change the way they provided services due to the developing changes in technology (Fung, 2006). The focus of Fung’s study was labor-saving technologies in the banking industry. The literature showed technology’s responsibility for changes in the skill-structure of employment. Fung's (2006) study noted that "the increased employment of high-skilled labor may be related to a changing workplace organization marked by a greater reliance upon computers and communication technologies, in which a different set of skill is required" (p. 195). Accounting is another example of a field forced to use more technology. According to Schader, Wailoo, and John (2012), professionals of today, such as practicing CPAs, expect college graduates entering the field to be knowledgeable of the technology being used in the industry. Technology skills are necessary in all types of jobs. Experience with basic computing skills, Web-based programs, and emerging technology are a good start in preparing students for the workplace.

Technology can be used in all fields to expand professional development. With email and virtual conferencing tools, professionals are no longer required to travel long distances to collaborate with their peers across the nation or globe. For example, elementary through university level educators in Alaska use technology to enhance their communication through the Alaska Educational Innovations Network. These teachers get newsletters on a Website established for their group as well as use Google sites to share and revise documents. The most engaging use of technology has come from small groups based on individual disciplines that met virtually on a regular basis and also incorporated social networking into their collaboration (Chesbro & Boxler, 2010). Technology allows these educators to continue their professional development without frequent travel and often on their own schedule.

> These tools expand the reach of our voices beyond that capacity of more traditional modes of professional learning. Technology not only brings the Alaska Educational Innovations Network together, it levels the traditional hierarchy and

> is key to building our learning communities, sharing wisdom, and nourishing learning. (Chesbro & Boxler, 2010, p. 53)

Through technology these educators were able to collaborate in ways that would otherwise not have been as efficient or cost effective. Technology allows professionals in many fields to work more efficiently while saving travel time and being able to communicate more quickly and clearly.

Future of the Workforce

Technology originally designed for personal use or entertainment, such as augmented reality, are being used in the workforce. Glasses with a tiny Augmented Reality (AR) camera can assist workers, allowing them to read instructions while using both hands on the job (Karsten & West, 2017; Levy, 2017). Some manufacturers running AR pilot programs report efficiency gains of over 30 percent (Abraham & Annnunziata, 2017). This is new technology being used by industries to move their companies forward and improve their product and productivity in a more efficient work environment.

The perception of this new technology by the public may be very different than that of leaders in industry. Public perception studies by the Pew Reseach Center found that “around three-quarters of Americans expect increased inequality between the poor and rich, if machines can do many human jobs” (Smith & Anderson, 2017, p. 3). Smith and Anderson also reported that the majority of those surveyed believed that, in the future, doctors would use computer prograns for diagnoses and treatment of diseases, deliveries would be by robots or drones, and stores would be fully automated with little human interaction. Health professions dominate the top ten fastest growing occupations lists (California, State of, 2017; Drews, 2014; US Bureau of

Labor, 2017) and technology use increased just as fast in the health profession as in any other profession. Another example could be fast food chains that introduced self-service kiosks (Graham, 2017; West, 2016). Smith and Anderson (2014) surveyed experts who were basically split (52% to 48%) on the impact of robotic advances and artificial intelligence on the American workforce. Whether self-driving cars or manufacturing robotics, the number of workers displaced and jobs created over the next decades is unknown.

Chapter Summary

The literature shows a change in jobs at low-, middle-, and high-skilled levels due to technology and predicts continued changes in the future. The literature suggests more training for current workers, current educators, and upcoming workers. Technology affects the workforce and will continue to do so around the world. The types of jobs this will create and eliminate is yet to be determined. The literature found high-skilled jobs benefit most from technological advances with low-skilled jobs negatively impacted by outsourcing or wages not increasing at a competitive rate. The research from the current study will identify the different types of technology used by major employers in Claiborne County as an example of a small town workforce. This study will survey employees across multiple disciplines to determine the different types of technology being used at different skill and wage levels and identify potential skills gaps. This may indicate the types of training and education needed to take on more technologically advanced jobs, keeping in mind that both incoming workers and current workers will need training. With a state initiative to have more Tennesseans graduating from college, this study will identify the areas of employment that need higher-skilled employees with a level of experience and comfort with technology. If historical trends continue concerning the growth of technology in the workplace, this study should uncover the technology trends in Claiborne County as an example of a small rural town in east Tennessee.

CHAPTER 3

RESEARCH METHODOLOGY

As evidenced in the literature review, the use of technology has grown in all fields of work. Therefore, the purpose of this non-experimental, quantitative study was to examine the technological knowledge and skill requirements of employees in Claiborne County, TN when comparing technology needs and uses by different job skill levels. A survey determined the technology used, training provided, and salaries offered by major employers in Claiborne County as an example of a small town workforce. The survey also assessed potential skill gaps and perceptions of changes in technology in the workforce. The study identified the level of jobs requiring more technology skills and salaries or training related to these job skill levels.

According to McMillan and Schumacher (2010), “The purpose of the research design is to specify a plan for generating empirical evidence that will be used to answer the research questions” (p. 20). This study used a comparative and correlational non-experimental, quantitative research design. The research compared technology use, skill levels, salaries, and technology training. Analysis determined whether there was a correlation between technology use, skill levels, and pay scales.

Research Questions and Null Hypotheses

The survey addressed the following research questions. The research questions and their corresponding null hypotheses relating to technology use, skill level, training required, pay scale and education level are:

RQ1. Is there a significant difference in the number of different types of technology used between employees in low-, middle-, and high- skilled jobs?

Ho1. There is no significant difference in the number of different types of technology used between employees in low-, middle-, and high-skilled jobs.

RQ2. Is there a significant relationship between the amount of technology training required for employees and their job skill levels (low, middle, or high)?

Ho2. There is no significant relationship between the amount of technology training required for employees and their job skill levels (low, middle, or high)?

RQ3. Is there a significant relationship between employee level of education and job skill level (low, middle-, or high)?

Ho3. There is no significant relationship between employee level of education and job skill level (low, middle-, or high)?

RQ4. Is there a significant relationship between pay and number of different types of technology used by employees?

Ho4. There is no significant relationship between pay and number of different types of technology used by employees.

RQ5. Is there a significant relationship between pay and employee job skill level (low-middle, or high)?

Ho5. There is no significant relationship between pay and employee job skill level (low-middle, or high)?

Instrumentation

An electronic survey aided data collection concerning different types of technology and on-the-job technology training used in the workforce. The survey was developed in an electronic survey tool, Google Forms, for ease of data collection. The development of the survey included soliciting feedback from colleagues and individuals in various job skill levels. Feedback and suggestions on salary levels and technology types were incorporated into the final survey. Job skill levels were determined by prior literature using low-, middle-, and high- skill job levels based on educational attainment (Achieve, 2012; Rothwell, 2016; Stark & Poppler, 2016).

An original survey was developed to specifically address the research questions of this study (see Appendix A). The study employed original surveys containing ten items, and collected demographic information, such as county of residence and company name, at the beginning of the survey. Demographic questions were kept to a minimum for the purpose of confidentiality. The length and types of questions were designed to be answered quickly and easily with only three open-ended questions. Multiple choice type items were used to determine the highest level of education, minimum required level of education for the participants' position, amount of technology training, and salary range.

The survey asked the participants their current highest level of education for comparison to the education level required for their current position. The survey asked the participants minimum required level of education for their current position to determine job skill level. The survey targeted employees of all types and job levels. The options regarding current salary had category options including both hourly pay rates as well as annual salaries, to allow participants on all types of pay scales to answer more easily. The salary ranges started near minimum wage and maxed out at $60,000 or above with broad categories to ease the tension of participants divulging specific salaries.

To determine the different types of technology used, the survey offered a list of eight types of technology with the option to choose all that applied. Options for “Currently do not use any technology” and “Other” were present with a fillable text box for “Other.” The survey concluded with a question inquiring about knowledge of any future plans for the company to incorporate more technology and open-ended questions about future plans for technology use and training options available in their county.

Population and Sample

Claiborne County is a rural county located in upper East Tennessee. This is an underserved county with over 20% of its population living in poverty in 2015, while the state’s overall poverty level is closer to 16%. The residents’ median age in 2015 was 42 years old. Health care, education, and manufacturing were the most common industries in 2015, while construction, production, and transportation were the top three occupations. At 7.1%, the unemployment rate was above the state average of 5.7%. Over half (55%) of the workers received a private wage or salary, while 39% were self-employed (City Data.com, 2017). The US Census Bureau (2012-2016) reported that only 77.2% of residents over the age of 24 had a high school degree or higher in Claiborne County, while the State of Tennessee overall had a high school degree or higher attainment rate of 86%. Workers aged 16 and up traveled an average of 24.3 minutes to work each day. The median household income in 2012-2016 was $33,428 per year compared to a state level of $46,574. The per capita income for Claiborne County was $19,215 compared to the state at $26,019 (United States Department of Commerce, 2018). Claiborne County, like many other small rural towns, had lower wages and higher poverty rates making low-skilled jobs or additional training in high demand.

The population for this study consisted of employers in Claiborne County who employed at least five people. According to the Center for Workforce Development (2018), manufacturing, education, and healthcare were among the top industries in Claiborne County in 2017. The five major types of employers used in the current study were manufacturing, education, healthcare, banking, and other small businesses. Using companies with at least five employees eliminated some small family businesses. According to the United States Census Bureau (cited in United States Department of Commerce, 2017), there are over 100 employers in Claiborne County that employ more than five people and over 400 total employers employing over 7,000 people. The list of companies contacted for this study came from the local Chamber of Commerce with the criteria of having at least five employees and a physical presence or office in Claiborne County. The Chamber of Commerce provided a list of employers as well as directed the researcher to their website for contact information.

Data Collection

Prior to collecting data, the Institutional Review Board (IRB) at East Tennessee State University granted permission to do so. The local Chamber of Commerce in Claiborne County provided contact information for human resources directors or managers who shared the survey with their employees. The researcher also spoke at the local Chamber of Commerce Board of Directors meeting and Board of Education meeting in order to encourage participation in the study. Initial contact with the companies in Claiborne County was via email or phone, wherein the researcher asked them to share a link to the survey with their employees. If emailing the link was not an option, the researcher took an iPad to the company and offered the survey to employees on the iPad. Participation was voluntary on the part of the employer to share the link and on the part of the employee to take the survey. Surveys were through an electronic survey tool, Google Forms. Employees in Claiborne County received the survey by email or through the iPad of the researcher. Some companies, including manufacturing companies, restricted survey access to employees with email. Electronic surveys offered ease of data compilation.

Twenty-eight companies chose to participate and 336 employees responded to the survey. The survey was open for approximately 30 days with a two-week window from the time of last company agreeing to participate until closure of the survey. Participants were aware of the use for the survey and the purpose of the research. They were also assured of confidentiality and that participation was voluntary. To gain access to the survey, participants agreed they had read the consent and confidentiality information, were at least 18 years of age, and employed full-time.

Data Analysis

Analysis of data from the survey was through a non-experimental, quantitative methodology. Statistical Package for Social Science (SPSS) data analysis software conducted data analysis. The data analyzed were from a survey wherein the types of questions on the survey pertained to the amount of technology used on the job, education, salaries, and types of technology training provided by the company.

There were five research questions with corresponding null hypotheses. Analysis of Research Question 1 was with an Analysis of Variance (ANOVA) test. Research Questions 2, 3, and 5 used a series of Chi-square tests, and Research Question 4 used the Spearman Rho Correlation test. All data were analyzed at the .05 level of significance. Table 1 shows a summary of research questions, corresponding survey questions, and statistics used for each.

Table 1

Summary of Research Questions, Survey Questions and Statistical Analysis.

		Survey questions		**Statistics**
RQ1	# of types used vs. job skill levels	S6, S4	S6. Technology types used S4. Job credential	ANOVA
RQ2	Amount of training vs. job skill levels	S7, S4	S7. Training S4. Job credentials	Pearson Chi-square
RQ3	Highest level of Ed Credentials vs. Required Ed (or job skill level)	S3, S4	S3. Employee credentials S4. Job credentials	Pearson Chi-square
RQ4	Salary vs. # of types used	S5, S6	S5. Employee salary S6. Technology types used	Spearman rho Correlation
RQ5	Salary vs. job skill level	S5, S4	S5. Employee salary S4. Job credentials	Pearson Chi-square

Chapter Summary

The purpose of this non-experimental quantitative study was to examine the technological knowledge and skill requirements of employees in Claiborne County, TN regarding technology needs and uses compared by different job skill levels. This non-experimental, quantitative study used a survey to obtain information from employees in Claiborne County. This study identified the level of jobs requiring more technology skills. Chapter 4 will contain an analysis of each research question. A summary and conclusion of the research will be in Chapter 5 along with recommendations for educators and employers concerning the need for technology training in the future.

CHAPTER 4

FINDINGS

The purpose of this study was to examine the technological knowledge and skill requirements of employees in Claiborne County, Tennessee regarding technology needs and uses compared by different job skill levels. A survey determined the level of technology use and training provided by major employers in Claiborne County. Administration of the surveys was electronic using Google Forms. Area business leaders received a link to the survey by email and forwarded that link to their employees. In some cases, where email links were not possible, the researcher took an iPad containing the link to the business and presented it to the employees. For this study, all survey questions were optional; consequently, the data excluded any blank questions for each relative research question.

The survey garnered 336 submissions representing 28 employers in such areas as banking, education, healthcare, manufacturing, and small business. Some manufacturing companies limited survey access to employees with email. Of the 336 submissions, 329 individuals identified their employer and job skill level. Table 2 shows a breakdown of employers and job skill levels identified within each company type.

Table 2

Employer Types by Job Skill Level Participants

	Low-Skilled	Middle-Skilled	High-Skilled
Banking	30	9	11
Business	27	12	1
Education	12	16	125
Manufacturing	17	15	6
Medical	15	17	16

Study participants identified the different types of technology used at their place of business. Individuals selected "all that apply" from a list of technologies, which included digital time clock, cash register, computer, digital scanner, mobile tablet, cell phone, gaming device, and automated or robotic equipment. Participants also had the opportunity to list other types of technology, which were scored as one type regardless of the number listed. Table 3 shows the participant use for each type of technology as opposed to a sum amount of different types being used by individuals. The number of different types of technology used in Research Questions 1 and 4 refers to a sum of different types of technology used by each participant in the workplace. The computer or laptop was the most common type (93%) of technology reported by 314 individuals with only 2% (7 individuals) using no technology at all.

Table 3

Number of Individuals Using Each Type of Technology

Technology Options	Number	Percentage
None	7	2%
Digital Time Clock System	119	35%
Cash Register or Payment System	61	18%
Desktop or Laptop Computer	314	93%
Digital Scanner/Other Handheld Digital Device	134	40%
Mobile Tablet or iPad	174	52%
Cell Phone	178	53%
Automation or Robotic Equipment	35	10%
iPod or Gaming Device	11	3%
Other	20	6%

For the current study, job skill level refers to the minimum education required for the individual's current position. Low-skilled jobs typically require no more than a high school diploma; Middle-skilled jobs typically require more than a high school diploma, but less than a four-year degree; and High-skilled jobs typically require at least a four-year degree. Participants indicated their current highest level of education, ranging from a high school diploma to a doctorate. Options for this question included a high school diploma, certificate beyond high school diploma, some college courses but not degreed, two years of higher education, such as an Associate's degree, four years of higher education, such as a Bachelor's degree, graduate work beyond a Bachelor's degree, Master's degree, and Doctorate. These data then collapsed into categories matching the three skill levels for analysis. To determine the difference between highest level of education earned and minimum education required for current job, research question 3 used a scale of -2 to +2, based on the level of difference in degrees using the same three educational levels as used for job skill levels. For example, if an individual were in a Low-skilled job, but had earned a degree equivalent to a High-skilled job, it would be scored as a +2 for two degrees of education higher than the job required.

Survey items concerning the amount of time spent on technology training and salary had categorical options, such as "more than 1 day but no more than 1 week" and "less than $15,000 (less than approx. $7.21)". Technology training refers to time spent in on-the-job training outside of general orientation and ranged from none to more than one month. Salary ranges were in annual and hourly pay increments, ranging from less than $15,000 per year (approximately $7.21 per hour) to more than $60,000 per year (approximately $28.84 per hour). SPSS ran statistical analyses on the data obtained from the surveys.

Results

Research Question 1

RQ1. Is there a significant difference in the number of different types of technology used between employees in low-, middle-, and high- skilled jobs?

Ho1. There is no significant difference in the number of different types of technology used between employees in low-, middle-, and high-skilled jobs.

A one-way analysis of variance was conducted to evaluate the relationship between the use of technology and job skill levels. The independent variable, job skills, included three levels, Low-, Middle-, and High-skilled jobs based on minimum educational requirements for the job. The dependent variable was the number of different types of technology used by the employee. The ANOVA was not significant at the .05 level, $F(2,332) = .753$, $p = .472$; therefore, not rejecting the null hypothesis. The strength of the relationship between technology use and job skill level, as assessed by η^2 (.005) was low with job skill level accounting for less than 1% of the variance of the dependent variable (number of different types of technology used). Figure 1 compares the means for all job skill levels and shows that all three job skill levels used primarily two to four different types of technology. Low- and Middle-skilled jobs reported use of none to seven different types of technology, while High-skilled jobs used one to seven different types of technology. Table 4 shows the mean, standard deviation, and *N* for all three job skill levels. There is no significant difference in the amount of technology used in Low-skilled jobs, Middle-skilled jobs or High-skilled jobs; all use technology.

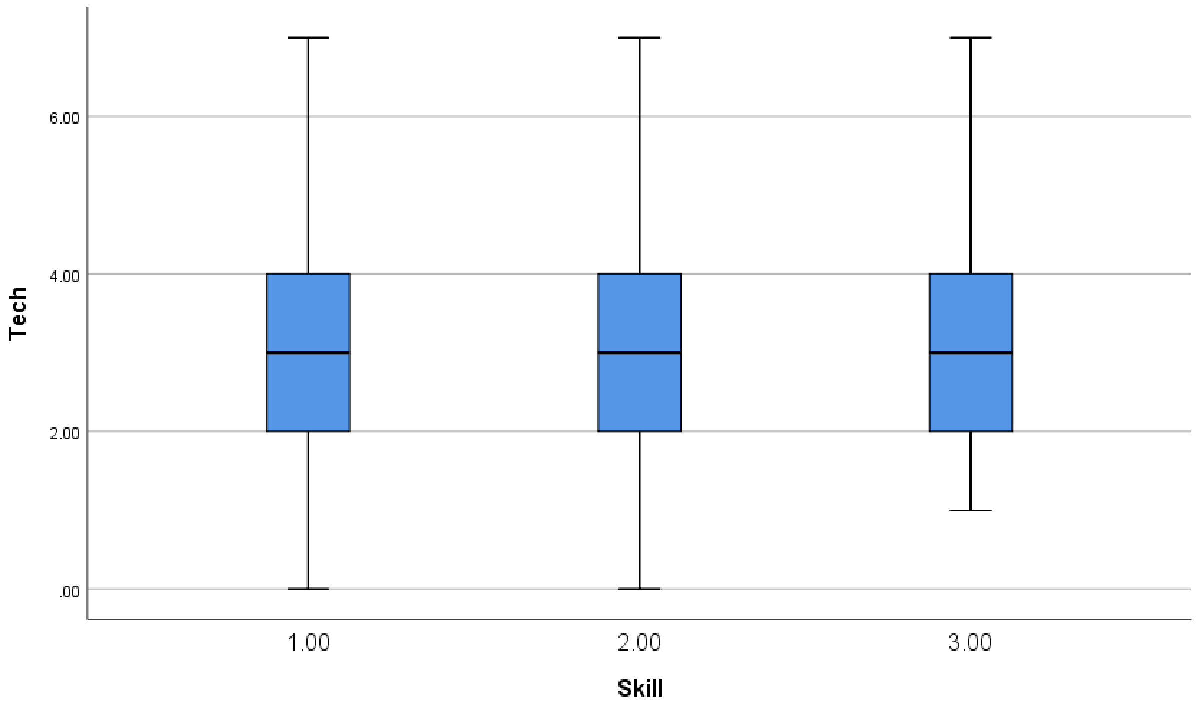


Figure 1. Number of different types of technology used by job skill level (1.00 = Low-skill, 2.00 = Middle-skill, and 3.00 = High-skill jobs).

Table 4

Descriptive Statistics for the Number of Different Types of Technology used in Low-, Middle-, and High-skilled Jobs

	Mean	*SD*	*N*
Low- skill jobs	3.14	1.69	101
Middle- skill jobs	2.92	1.54	71
High- skill jobs	3.17	1.35	163
Total	3.11	1.50	335

Research Question 2

RQ2. Is there a significant relationship between the amount of technology training required for employees and their job skill levels (low, middle, or high)?

Ho2. There is no significant relationship between the amount of technology training required for employees and their job skill levels (low, middle, or high).

A two-way contingency table analysis evaluated whether a significant difference existed in the amount of technology training required for employees in Low-, Middle-, and High-skilled jobs. The two variables were job skill level, based on minimum education required for the job, and the amount of technology training required, based on the number of hours spent in on-the-job technology training. Job skill levels and technology training were significantly related, Pearson X^2 (8, N=332) = 34.67, $p < .001$, Cramer's V= .229, therefore rejecting the null hypothesis. The proportions of employees who required more on-the-job technology training in Low-, Middle-, and High-skilled jobs were .75, .86, and .95, respectively.

Follow-up comparisons evaluated the difference among these proportions. Table 5 shows the results of these analyses. Two pairwise differences were significant, the difference between the Low- and High-skilled jobs and the Middle- and High-skilled jobs. There was not a significant difference in the amount of technology training between the Low-skilled jobs and the Middle-skilled jobs. The probability of an employee requiring on-the-job technology training was about 1.26 times (.95/.75) more likely in High-skilled jobs as it was in Low-skilled jobs, and 1.10 times (.95/.86) more likely in High-skilled jobs as opposed to Middle-skilled jobs. The amount of training for High-skilled jobs was significantly more than the amount of training for both Middle- and Low-skilled jobs. There was no significant difference in the amount of training for Middle- and Low-skilled jobs. Figure 2 shows the amount of training required in Middle- and High-skilled jobs.

Table 5

Pairwise Comparisons of Amount of Technology Training Required by Job Skill Level

	Pearson chi-square	*df*	*p* value	*N*	Cramer's V
Low- vs Middle-skill	6.1	4	.192	172	.188
Low- vs. High-skill	29.7	4	<.001	261	.337
Middle- vs. High-skill	14.2	4	.007	231	.248

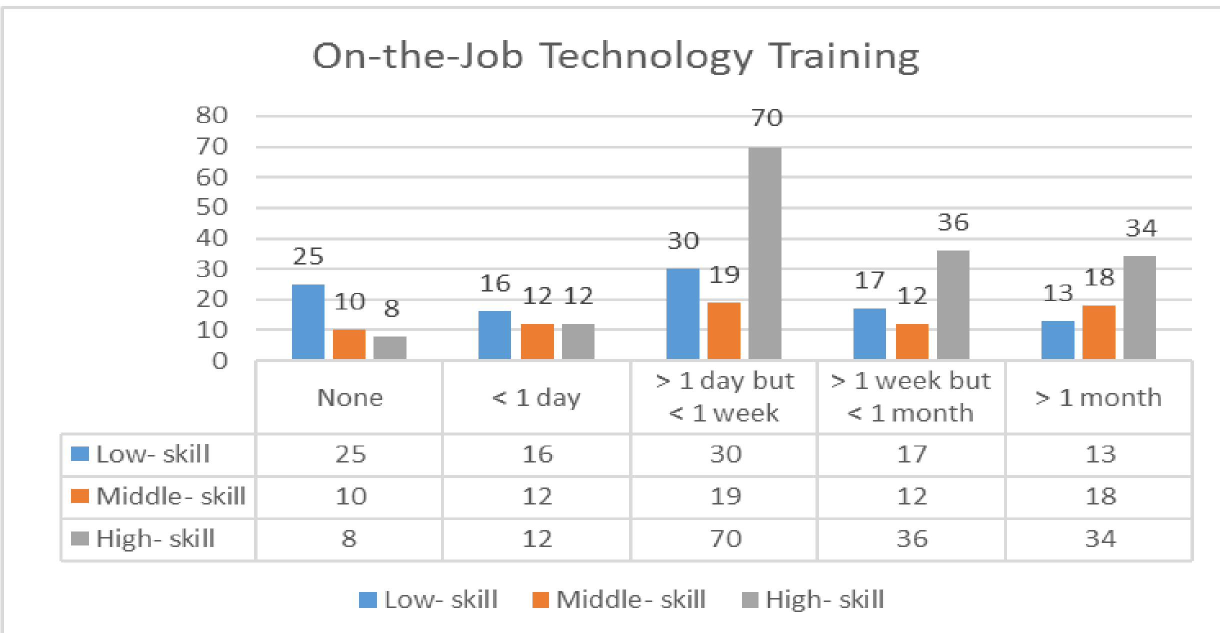


Figure 2. Training requirements for Low-, Middle-, and High-skilled jobs.

Research Question 3

RQ3. Is there a significant relationship between employee level of education and job skill level (low, middle-, or high)?

Ho3. There is no significant relationship between employee level of education and job skill level (low, middle-, or high).

A two-way contingency table analysis evaluated whether a significant difference existed in the employees' education and job skill level. The two variables were the employees' highest level of education and the job skill level of their current position based on the minimum education required for the position. Education and job skill level were significantly related, Pearson X^2 (4, N=335) = 251.17, p<.001, Cramer's V = .612, therefore rejecting the null hypothesis. The proportion of employees with education levels consistent with the minimum required education for their jobs (Low-, Middle-, High-skilled jobs) was .42, .58, and .99, respectively.

Follow-up comparisons measured the difference among these proportions. Table 6 shows the results of these analyses. All three pairwise differences were significant. The probability of individuals having education higher than that required for their job was 1.38 (.58/.42) times higher in Middle-skilled jobs than in Low-skilled jobs, 1.7 (.99/.58) times more likely in High-skilled jobs over Middle-skilled jobs, and 2.36 (.99/.42) times higher in High-skilled jobs as opposed to Low-skilled jobs. Figure 3 shows the amount of education attained in Low-, Middle- and High-skilled jobs.

Figures 4 and 5 illustrate the difference in individuals' highest level of education and the minimum education required for their job. Figure 4 shows that 244 individuals of 335 (73%) had the appropriate level of education for their current job, while 24% of all participants had an education higher than that required for their job and only three percent indicated that they had not earned the minimum education required for their job. Figure 5 breaks it down by job skill level, showing that the majority of individuals (59%) in a Low-skilled job actually had some educational training above the minimum required education for their job, which was a high school diploma, and only forty-two percent had only a high school diploma. The majority (58%) of workers in Middle-skilled jobs had the appropriate level of education, thirty-two percent had a higher degree than required while ten percent indicated they did not have the minimum education required for the job. The education of most individuals (99%) in Higher-skilled jobs matched the requirements for the job with only one percent of individuals not having qualifying credentials for their current job. Overall, most individuals were more likely to have the education required for their position; however, the lower the skill requirement for the job, the higher the chance of an individual having more education than required for that position.

Table 6

Pairwise Comparisons of Highest Level of Education Earned by Job Skill Level

	Pearson Chi-square	*df*	*p* value	*N*	Cramer's V
Low- vs Middle- skill	26.40	2	<.001	172	.392
Low- vs. High-skill	216.00	2	<.001	264	.905
Middle- vs. High skill	129.76	2	<.001	234	.745

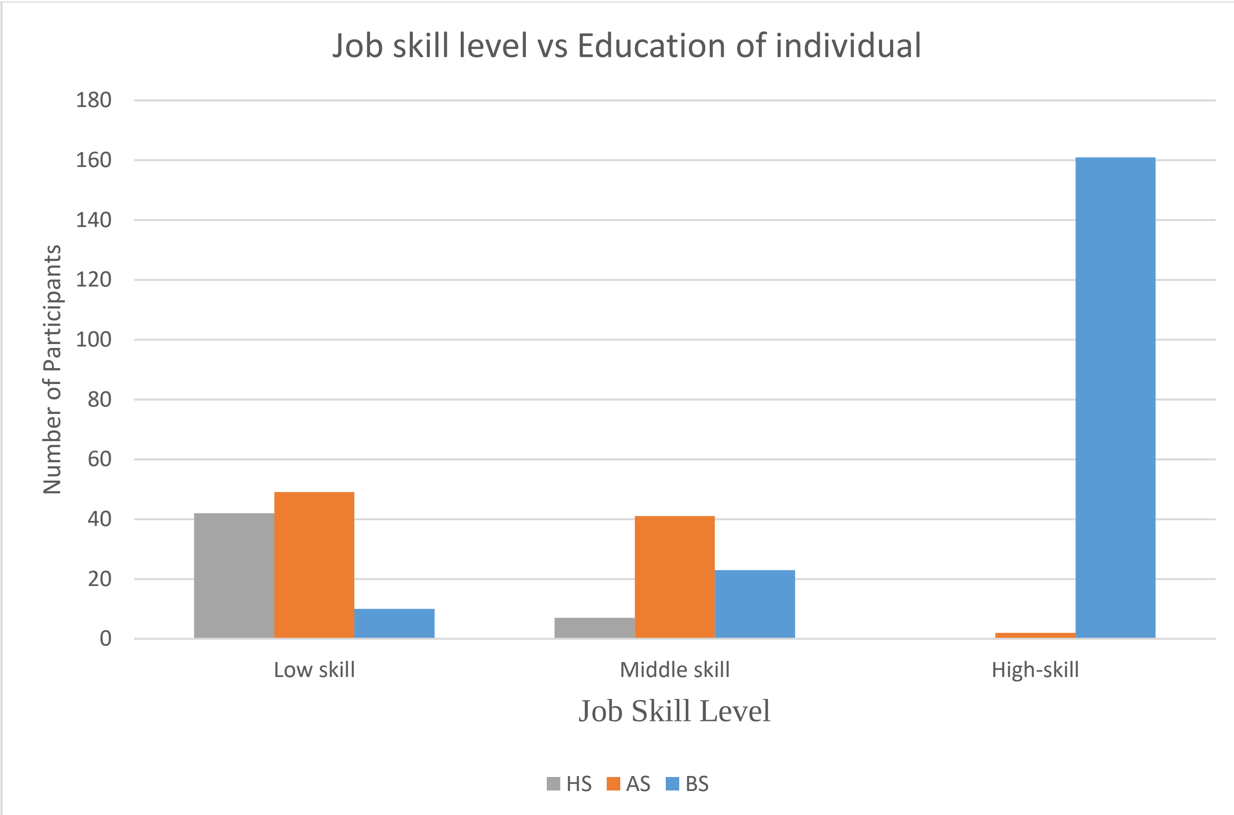


Figure 3. Highest level of education earned by job skill level.

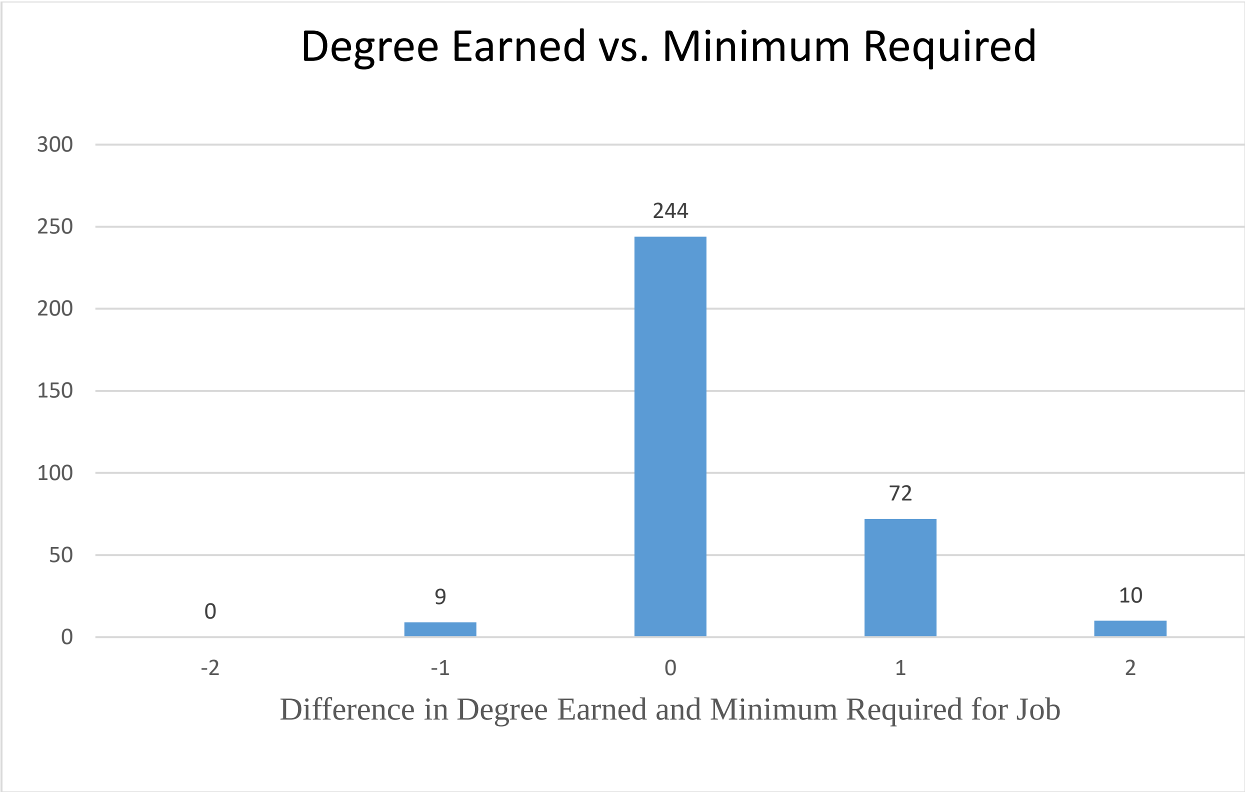


Figure 4. Difference in highest degree earned and job skill level (minimum education required for job).

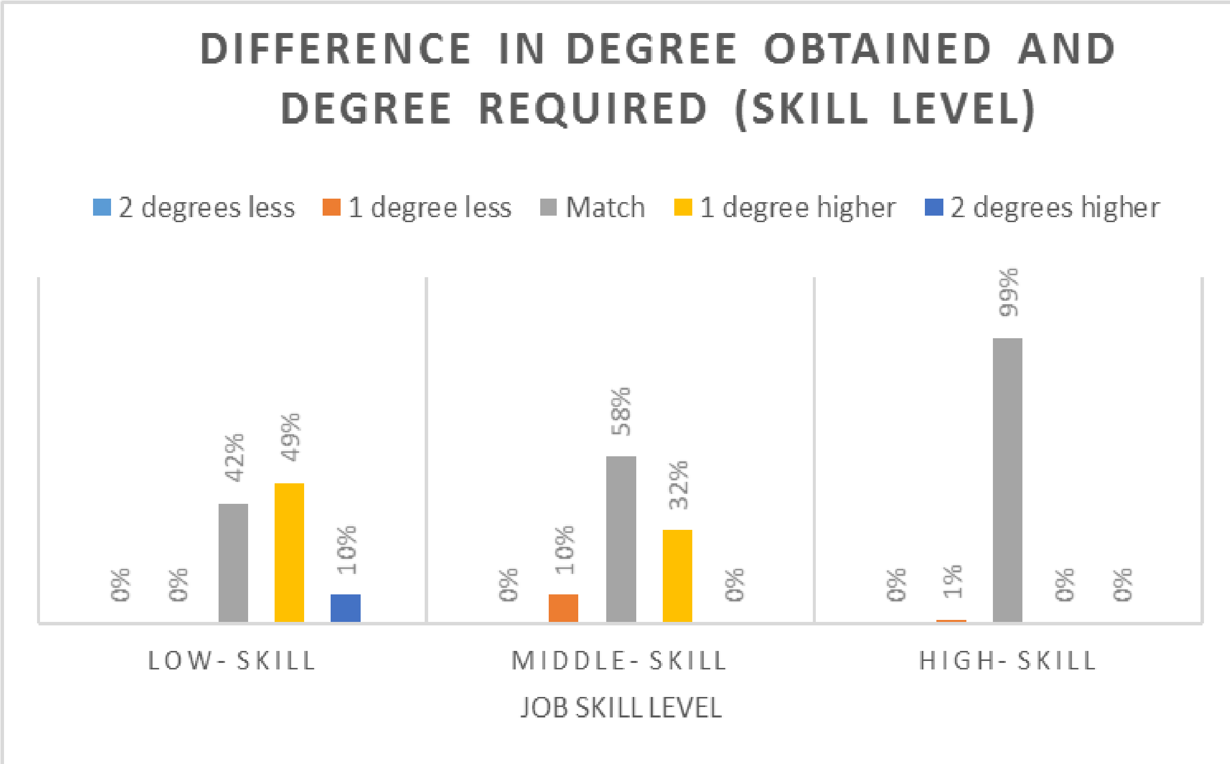


Figure 5. Difference in highest degree earned and minimum degree required for job (job skill level).

Research Question 4

RQ4. Is there a significant relationship between pay and number of different types of technology used by employees?

Ho4. There is no significant relationship between pay and number of different types of technology used by employees.

A Spearman rho Correlation coefficient tested the relationship between pay and the number of different types of technology used. The results of the analysis revealed a significantly positive relationship between Pay (M = 4.12, SD = 1.31) and Technology (M = 3.15, SD = 1.50) scores with a statistically significant correlation [r(321) = .139, p = .013]. These results are shown in Table 7. As a result of the analysis caused rejection of the null hypothesis. As shown in Figure 6, the results suggested that people with higher paying jobs tended to use a higher number of different types of technology. Figure 7 breaks down the number of participants by the number of different types of technology used on the job and salary range, again showing higher usage numbers in higher salary ranges.

Table 7

Comparison of Salary and Number of Different Types of Technology Used

	N	**Min**	**Max**	**Mean**	**Std. Deviation**	**Spearman's rho Correlation Coefficient**	**Significance**
Salary	323	1	6	4.11	1.31	.139	.013
Tech	323	0	7	3.15	1.49	.139	.013

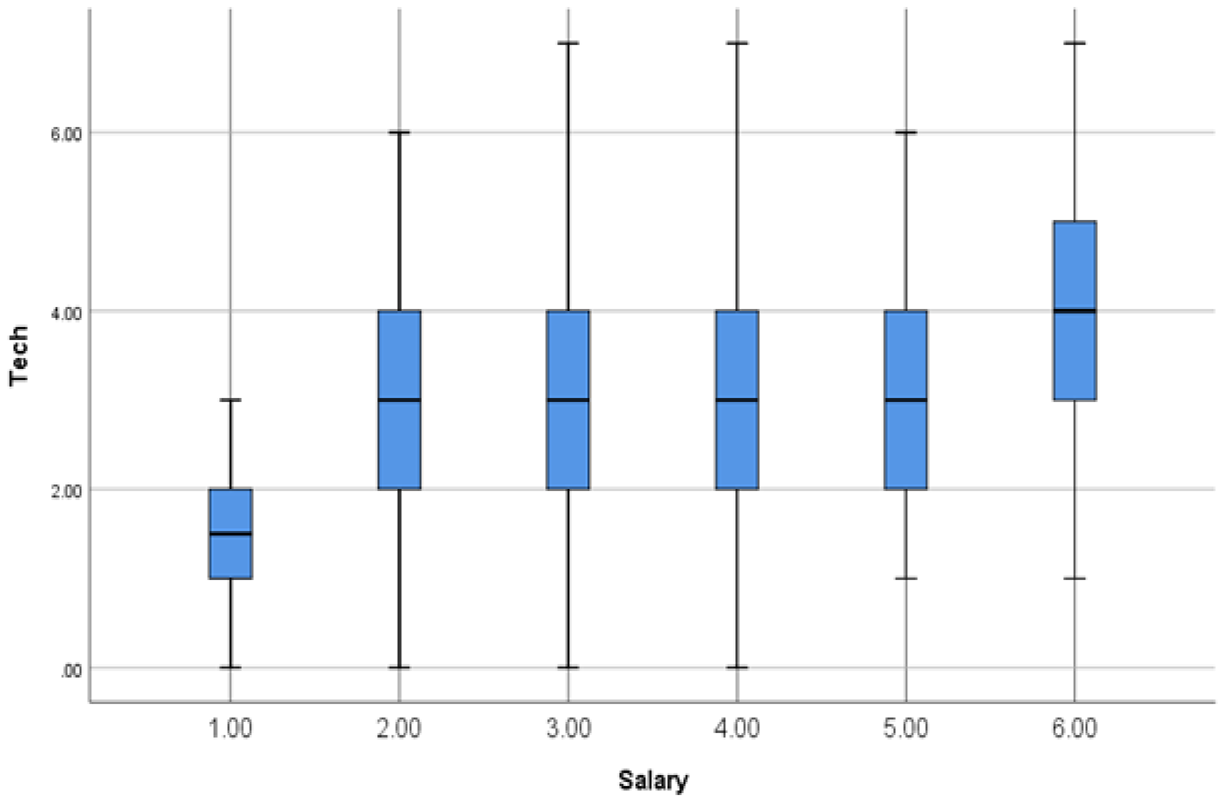
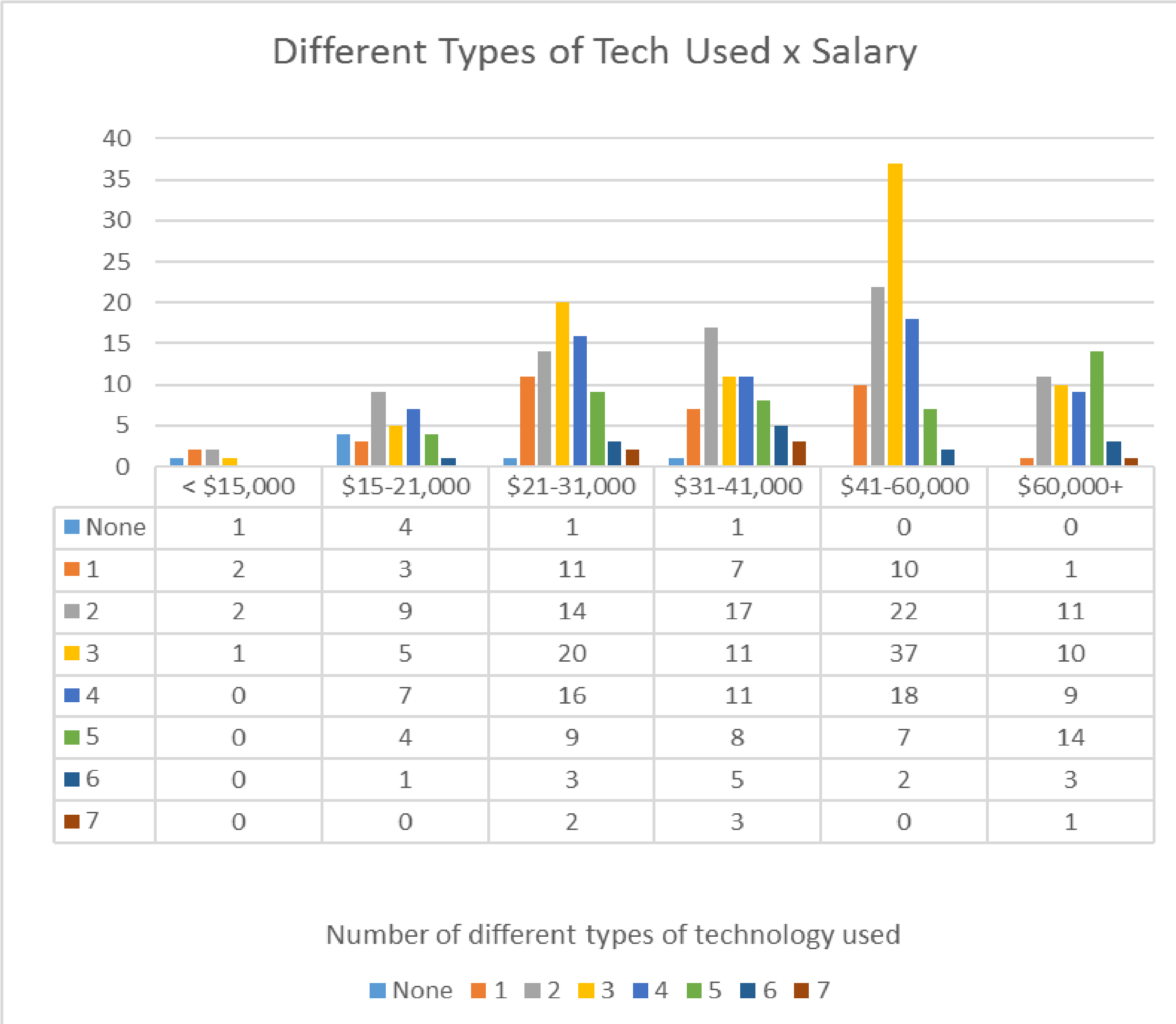


Figure 6. Number of different types of technology used by salary category.



	< $15,000	$15-21,000	$21-31,000	$31-41,000	$41-60,000	$60,000+
None	1	4	1	1	0	0
1	2	3	11	7	10	1
2	2	9	14	17	22	11
3	1	5	20	11	37	10
4	0	7	16	11	18	9
5	0	4	9	8	7	14
6	0	1	3	5	2	3
7	0	0	2	3	0	1

Figure 7. Amount of different types of technology used by salary category.

Research Question 5

RQ5. Is there a significant relationship between pay and employee job skill level (low-middle, or high)?

Ho5. There is no significant relationship between pay and employee job skill level (low-middle, or high)?

A two-way contingency table analysis evaluated whether a significant difference existed in salaries for employees in Low-, Middle-, and High-skilled jobs. The two variables were job skill level, based on minimum education required for the job, and the amount of pay. Job skill levels and pay levels were significantly related, Pearson X^2 (10, N=328) = 160.33, $p < .001$, Cramer's V= .494, therefore rejecting the null hypothesis. The proportions of employees pay above $41,000 in Low-, Middle-, and High-skilled jobs were .05, .37, and .74, respectively.

Follow-up comparisons evaluated the difference among these proportions. Table 8 shows the results of these analyses. Three pairwise differences were significant; that was the difference between the Low- and Middle-skilled jobs, Low- and High-skilled jobs, and the Middle- and High-skilled jobs. The probability of an employee's salary being above $41,000 was about 7.4 times (.37/.05) more likely in Middle-skilled jobs than it was in Low-skilled jobs, 14.8 times (.74/.05) more likely in High-skilled jobs as opposed to Low-skilled jobs, and 2 times (.74/.37) more likely in High-skilled jobs as opposed to Middle-skilled jobs. The pay for High-skilled jobs was significantly more than the amount of pay for both Middle- and Low-skilled jobs and the amount of pay for Middle-skilled jobs was significantly more than the amount of pay for Low-skilled jobs. Figure 8 shows the amount of pay earned in Low-, Middle-, and High-skilled jobs.

Table 8

Pairwise Comparisons of Salaries by Job Skill Level

	Pearson Chi-square	*Df*	*p* value	*N*	Cramer's V
Low- vs Middle- skill	36.730	5	<.001	165	.472
Low- vs. High-skill	152.18	5	<.001	260	.765
Middle- vs. High skill	45.96	5	<.001	231	.446

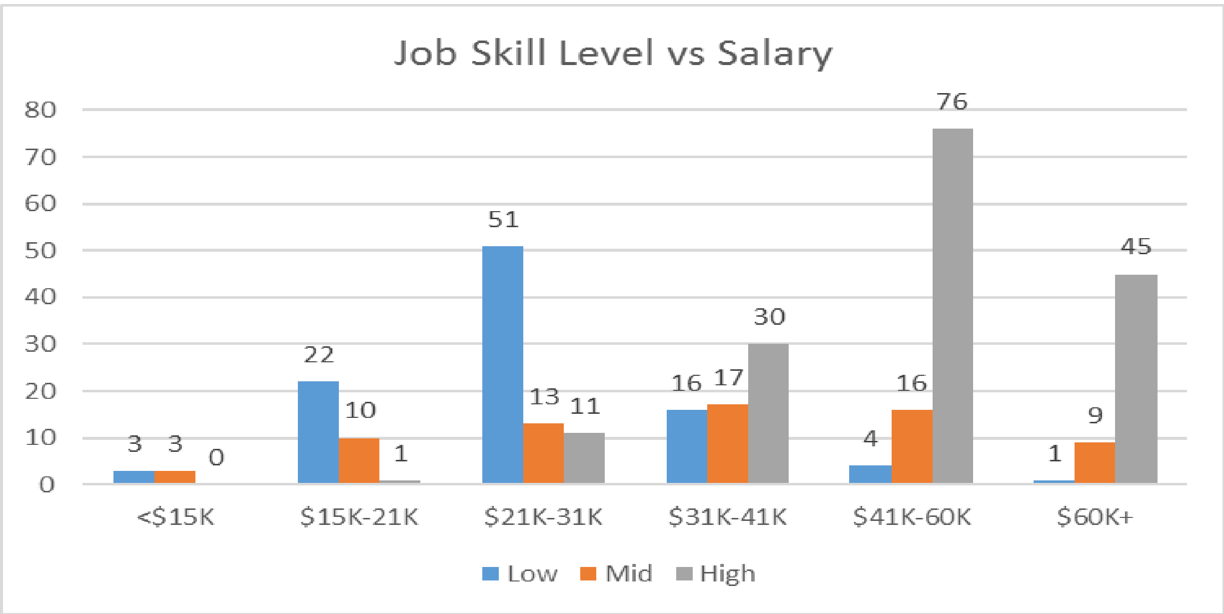


Figure 8. Number of participants in Low-, Middle-, and High-skilled jobs by salary category.

Chapter Summary

This chapter presented the analyses of data obtained from a survey of employees in Claiborne County, Tennessee. Included in the survey were questions about types of technology used on the job, amount of on-the-job technology training required, salaries, educational levels required for the job, and the individuals' highest level of education. The study examined five research questions and null hypotheses. The study found no significant difference in the amount of technology used in Low-, Middle-, or High-skilled jobs. However, the most frequently used type of technology reported was a laptop or desktop computer. On-the-job technology training was more likely required in jobs with higher skill levels. The majority of individuals in a Low-skilled job had educational credentials higher than their job required. Individuals in higher paying jobs used more types of technology and individuals in higher skill jobs had higher salaries.

CHAPTER 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Chapter 5 presents a summary of findings, conclusions, and recommendations regarding the use of technology in the workforce. The purpose of this study was to examine the technological knowledge and skills requirements of employees in Claiborne County, Tennessee regarding technology needs and uses compared by different job skill levels. A survey collected information from employees in the county. Respondents consisted of 336 individuals who submitted electronic surveys for this study. These individuals worked for 28 different employers in banking, education, healthcare, manufacturing, and other small businesses. All participation was voluntary, confidential, and anonymous.

Summary and Discussion of Findings

The findings reported addressed the five research questions posed by the study. The variables included the number of different types of technology used, job skill levels based on minimum education required for the job, highest level of education earned, amount of on-the-job technology training required, and salary.

Analysis for Research Question 1 found no significant difference in the number of different types of technology used by employees in Low-, Middle-, and High-skilled jobs. All levels of jobs typically required 2-4 different types of technology. Desktop or laptop computers were the most common type of technology listed at 93% with mobile tablets and cell phones second most popular with over half of the participants reporting use at 53% and 52%, respectively. Therefore, over half of the participants in this study reported using some type of computer or mobile technology at their job. This was much higher than the 2015 Pew survey that found "nearly two-thirds of Americans own a smartphone, and 19% of Americans rely to some degree on a smartphone for accessing online services and information" (cited in Smith, 2015, p. 1). The amount of computer usage agreed with the 2013 survey of employed Internet users that revealed that 94% of personnel from technology companies to non-technology firms were Internet users (Purcell & Rainie, 2014). The current study also confirmed the study by Mirvis, Sales, and Hackett (1991), which looked at the impact of new technology during the time when computers entered the workplace. They estimated that "over two-thirds of the technical, managerial and administrative workforce in the US [were] using computers on their jobs" (p. 113). They also found that "some three-fourths of a sample of Conference Board companies surveyed [at that time] report[ed] that they [had] spent a 'significant amount of time and money' over the [previous] ten years to computerize their offices and factories" (p. 113). With the use of cell phones and mobile technology on the rise, this number is likely to increase over time. There were only seven individuals (fewer than 2% of participants) reporting that they did not use any type of technology on the job and these were all in small businesses.

Research Question 2 identified significance in the amount of on-the-job technology training required for employees in Low-, Middle- and High-skilled jobs. The amount of on-the-job training for individuals in High-skilled jobs was significantly higher than required in Low-or Middle-skilled jobs. Individuals in High-skilled jobs were 1.26 times more likely to need more on-the-job technology training than were those in a Low-skilled job and 1.10 times more likely than someone in a Middle-skilled job.

Research Question 3 revealed a significant difference in the highest level of education attained by an employee compared to that required for the employee in Low-, Middle-, and

High-skilled jobs. Only 42% of individuals in Low-skilled jobs reported having only a high school diploma (the minimum required for a Low-skilled job); the other 58% noted having some higher education experience. This indicated these individuals were likely academically qualified for a higher-level job than their current employment. Fifty-eight percent of individuals in Middle-skilled jobs reported having education above a high school diploma but less than a bachelor's degree, and 32% had earned at least a Bachelor's degree. A large percentage of individuals in Claiborne County do not have jobs that match their educational attainment; instead, they are more educated than their current position requires.

Research Question 4 showed a significantly positive relationship between pay and number of different types of technology used by employees. In Claiborne County, people with higher paying jobs tended to use more types of technology. Individuals in minimum wage jobs tended to use one type of technology, whereas individuals making over $60,000 used 3-5 types of technology.

Research Question 5 revealed a significant difference in pay for employees in Low-, Middle-, and High-skilled jobs. The average median household income in 2016 for Claiborne County was $33,400 (Center for Workforce Development, 2018). The probability of individuals making over $41,000 was 7.4 times more likely if they were in a Middle-skilled job rather than in a Low-skilled job and 14.8 times more likely if they were in a High-skilled job as opposed to a Low-skilled job. The time invested in higher education to qualify for a Middle- or High-skilled job significantly showed in salaries. The majority of individuals in High-skilled jobs made over $41,000, while the majority of individuals in Middle-skilled jobs made over $31,000, and Low-skilled employees peaked at the $21,000-$31,000 range. This study aligned with Stone, Blackman, and Lewis (2010) who considered the phrases "high skill, high wage" suggested technology-driven occupations that required a baccalaureate degree or higher and defined high wage as “anything above the median for all occupations. This means jobs that may pay between $30,000 and $40,000 per year” (p. 23). Stone et al. (2010) also suggested that most jobs fell into the middle-skills category, making in the median hourly wage range, which is consistent with this study.

Conclusions

The purpose of this study was to assess technology use, on-the-job technology training, education levels and salary ranges for employees in low-, middle-, and high- skill jobs in Claiborne County Tennessee. There were 336 individuals who participated in an electronic survey discussing these factors. Participants represented twenty-eight different companies in healthcare, education, manufacturing, banking, or other small businesses employing at least five people.

The major findings of the study included the following: a) multiple forms of technology are used in all job skill levels; b) more time is spent in on-the-job training for higher job skill levels; c) participants in lower job skill levels were more likely to have educational credentials higher than their jobs required; d) participants in higher paying jobs used more types of technology; and e) participants in higher skill level jobs tended to have higher salaries. The study concluded that, while technology affects all skill levels, there is a significantly positive relationship between salary, technology use, technology training, and job skill level. This research can contribute to conversations between faculty and community development groups including human resource managers regarding the use of technology in the workplace and the training required.

Recommendations for Practice

The findings of this study led to the conclusion that technology is in all levels of jobs and there is a positive relationship between technology use, salary, training, and job skill level. Students and potential workers need to know this in order to make informed decisions and be fully prepared for the workforce. From this study's findings, the researcher developed the following recommendations:

- Potential workers and students should consider the requirements needed for employment in their desired field to include technology use, salary ranges, and preferred academic requirements for the different job skill levels.
- Schools of higher education and high school counselors should educate students on the significant difference in salaries for individuals in the three job skill levels.
- Schools of higher education and high school counselors should educate students on the significant difference in the amount of technology being used in higher paying jobs.
- Colleges and technology centers should know the needs in their community in order to prepare students with the appropriate skills.
- For students who choose a path that includes higher education, colleges and universities should offer options outside the classroom that will help the students succeed in the workforce.
- High schools and colleges should ensure that all students receive basic computer training, including mobile technology, before entering the workforce.
- All potential employees should provide basic computer skills and mobile technology training in order to be competitive in the workforce.

- Educators at all levels should continue to teach using technology because the workforce will expect it of the students.

Recommendations for Further Research

A simple but significant finding of this study is that all types and levels of jobs require technology use. An interesting question that came from the study is why individuals with job skills for middle- or high-skilled jobs work in low-skilled jobs. Due to the findings and conclusions of this study, the following is recommended:

- More research be conducted on the specific types of technology used and training required.
- More studies be conducted to determine why individuals take positions with lower academic requirements.
- More research be conducted on specific requirements for different levels of jobs and job skills.
- More studies be done with employers to determine technology and educational requirements of current job vacancies.

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APPENDIX

Technology Survey

Technology in the Workforce

The purpose of this study is to assess the use of technology in the Claiborne County workforce. For this study, technology will include computers, software, robotics, and mobile technology. Your participation in this survey is completely voluntary for any and all questions and much appreciated.

1. What is your county of residence?

_____ Claiborne

_____ Union

_____ Grainger

_____ Other (please specify): _________________________

2. Who is your employer? ____________________________________

3. What is your current highest level of education?

_____ High school diploma

_____ Certificate beyond high school diploma

_____ Some college courses, but did not complete degree

_____ 2 years of higher education, such as an Associate’s degree

_____ 4 years of higher education, such as a Bachelor’s degree

_____ Graduate work beyond a Bachelor’s degree

_____ Master’s degree

_____ Doctorate

4. What is the minimum required level of education for your current position?

_____ No more than a high school diploma

_____ Education beyond high school without having earned a 4-year college degree, can include some college coursework, an earned associate’s degree, or completion of a certificate program.

_____ At least four years of higher education such as a Bachelor’s degree or higher

5. What is your current annual (or hourly) base salary range? (Note: Hourly rates are based on 40 hours per week for 52 weeks per year.)

_____ less than $15,000 (less than approx. $7.21 per hour)

_____ $15,001 - $21,000 (approx. $7.22 - $10.10 per hour)

_____ $21,001 - $31,000 (approx. $10.11- $14.90 per hour)

_____ $31,001 - $41,000 (approx. $14.91 - $19.71 per hour)

_____ $41,001 - $60,000 (approx. $19.72 - $28.84 per hour)

_____ More than $60,000 (more than approx. $28.84 per hour)

6. Please, select all the following types of technology required for your job/position.

_____ Currently do not use any technology

_____ Digital time clock system

_____ Cash Register or payment system

_____ Desktop or laptop computer

_____ Digital scanner or other handheld digital device

_____ Mobile tablet or iPad

_____ Cell phone

_____ iPod or gaming device

_____ Automation or robotic equipment

_____ Other (please specify): ______________________________________

7. Outside of general orientation, approximately how many hours have you spent on-the-job technology training?

_____ None

_____ Less than 1 day

_____ More than 1 day but no more than 1 week

_____ More than 1 week but no more than 1 month

_____ More than 1 month

8. Are you aware of any plans your company currently has to incorporate more types of technology?

_____ Yes (please specify) ___________________________________

_____ No

_____ Unsure

9. What type of training in technology does Claiborne County currently offer to prepare the workforce for your type of job?

____

____

10. What type of training would you like to see offered in your community to prepare the current workforce?

____

____

Thank you for your participation!

VITA

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