Work Values and Technology Skills of Students Enrolled in a Career and Technical Education Course at a Community College

by

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A dissertation submitted to the Graduate Faculty of
Auburn University
in partial fulfillment of the
requirements for the Degree of
Doctor of Philosophy

Auburn, Alabama
May 7, 2016

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Abstract

This study was designed to investigate: (a) the work values; (b) the technology skills concerning software, hardware, and technology tools; (c) the perceived competency level to complete basic computer tasks; and (d) the correlation between work values and technology skills of students enrolled in one or more CTE courses at a community college in a Southeastern state. Data were analyzed using the follow statistical procedures: Descriptive, Analysis of Variance (ANOVA), and Pearson product-moment correlation coefficient. The majority of respondents were female (71.3%). The highest reported age category was between the ages of 20 to 29 (42.9%). The largest percent of respondents identified themselves as Caucasian (52.9%). General Studies was the highest reported degree program (29.5%). There were no differences in students' overall work values across the degree programs groups. However, when ranked, students identified the extrinsic work values of high salary/income and opportunity to advance quickly as the two most important work values.

There were no differences in students' perceived competency to utilize hardware based on degree programs group; however, there were differences in students' perceived competency to utilize software technology and technology tools based on degree programs group. In addition, there were no differences in students' perceived need for further development of software skills, hardware skills, or technology skills. Collectively, students enrolled in a CTE course at a community college in a Southeastern state believed that they possessed the ability to complete basic computer tasks without assistance. The majority of respondents, did, however, identify

Excel tasks and Internet/web browser tasks that they could not perform. In this study, it was determined that there is no correlation between the overall work values and technology skills of students enrolled in one or more CTE courses at a community college in a Southeastern state.

Acknowledgements

First, I would like to express my sincere gratitude to my major professor, Dr. Leane Skinner for her commitment and encouragement throughout the last eight years of my graduate studies. Without her knowledge and mentorship, I would not be where I am today.

I would also like to thank the other members of my dissertation committee: Dr. Elisha Wohleb, Dr. Marie Kraska, and Dr. Gordon Patterson. They each invested time in me and this process to ensure that I have the skills and abilities to reach and exceed the goals I have set for myself.

This accomplishment would not have been possible without God, family, and friends. A special thanks to my parents, Bill and Vickie Springer, for their love and support throughout my extended college career. Thanks to my siblings, Zach, Wynn, and sister-in-law, Liz, for supporting me despite not always understanding what I actually did or was going to do. Many thanks to my many friends, with special thanks to: J. Sims, Kyle, Ben, Maiben, Marissa, and Lisa.

Lastly, I would like to extend special appreciation to the matriarch of my family, my grandmother, Lucy, for always loving, always helping, and always guiding without ever seeking recognition or praise.

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I. NATURE OF THE PROBLEM

Introduction and Background

We are currently at a crossroad in United States education reform. One road leads us down the same path that we, as Americans, have embraced for decades, the path that embraces diplomas, but does not guarantee graduates employment. The other road, the one currently being paved by elected officials, educators, and industry experts, focuses on preparing students to enter the workforce in high-demand fields rather than emphasizing the importance of a diploma. The United States Department of Education (USDE) Secretary Duncan (2011) stated the following concerning career and technical education (CTE):

> First, for far too long, CTE has been the neglected stepchild of education reform. That neglect has to stop. And second, the need to re-imagine and remake career and technical education is urgent. CTE has an enormous, if often overlooked impact on students, school systems, and our ability to prosper as a nation. The mission of CTE has to change. It can no longer be about earning a diploma and landing a job after high school. The goal of CTE 2.0 should be that students earn a postsecondary degree or an industry-recognized certification--and land a job that leads to a successful career. (p. 1)

Traditionally, CTE consisted of limited program offerings for high school students. These students were put on a separate "non-academic" track to be trained for a specific occupation; however, the new career and technical education, or CTE 2.0 as coined by Secretary Duncan, is for any student at the secondary and post-secondary level. While CTE programs of the past were

the dumping ground for academically low-performing students, new CTE programs are for all students. As of 2011, approximately 15 million high school and postsecondary students were enrolled in one or more CTE courses (Duncan, 2011). Moreover, CTE 2.0 is integrated with traditional academics and provides students with the ability to pursue employment or obtain an associate's or more advanced diploma. Most importantly, CTE 2.0 provides participants the occupational skills to successfully enter into the 21st century workforce (Association for Career and Technical Education (ACTE), 2015).

On January 28, 2014, President Barack Obama delivered his State of the Union address in which he stated:

> Teachers and principals in schools from Tennessee to Washington, D.C., are making big strides in preparing students with the skills for the new economy -- problem solving, critical thinking, science, technology, engineering, math. … We're working to redesign high schools and partner them with colleges and employers that offer the real-world education and hands-on training that can lead directly to a job and career. We're shaking up our system of higher education to give parents more information and colleges more incentives to offer better value, so that no middle-class kid is priced out of a college education… The bottom line is, Michelle and I want every child to have the same chance this country gave us. But we know our opportunity agenda won't be complete – and too many young people entering the workforce today will see the American Dream as an empty promise – unless we do more to make sure our economy honors the dignity of work, and hard work pays off for every single American. (State of the Union Address, 2014, pp. 4-5)

President Obama's State of the Union Address reiterates Secretary Duncan's belief that students must receive an education that prepares them to gain employment in high-growth, in-demand fields such as those students obtain after completing a CTE program.

Additionally, on March 4, 2014, the Alabama Senate passed a dual enrollment program for high school students. With the passage of this bill, individuals can donate money to support student scholarships for training in CTE areas. Not only will this bill provide students with training needed for employment in high-demand fields, but will also provide tax incentives for individuals making donations. According to the bill, "Donors would get a credit on their state income taxes worth up to 50 percent of their donation, up to 50 percent of their tax liability" (Cason, 2014, p. 1).

These examples, from President Obama, Secretary Duncan, and the Alabama Senate show a newfound commitment to CTE and the importance of training students to find employment in high-demand areas. According to The New York Times, there is currently a mismatch between skills and workers, a key factor in high unemployment rates (Rich, 2010). Moreover, the Institute for a Competitive Workforce (2008) issued a report stating that in-demand jobs "require at least a high school education; more likely, though, they require some level of postsecondary education and/or training, resulting in a two- or four-year degree, an industry-recognized credential, a certification, or some other terminal indication of mastery" (p. 3). To fill the employment gap, CTE programs must meet the needs of students by offering programs that align with students' interests and offering courses that align with students' values, goals, skills, and learning styles. According to ACTE (2010),

> Teaching and learning environments matter. Many students learn more when schoolwork is connected to their interests, to real-world problems, and to the worlds of work and

> college. Experiences outside the classroom, variation in the school day, and the ability to use technology and other hands-on tools engage students in learning – and help them discover new interests and passions. Instructional strategies that foster higher-order thinking and personalize learning to meet students' specific needs are critical as well. (p. 12)

With a student-centered learning approach, the courses and coursework are created around the students values, skills, needs, and learning styles. Handy and Braley (2012) found that academic content and CTE teachers believed "all students are different and must be taught according to their unique needs and abilities" (p. 20). However, their research also revealed that teachers held a slightly negative opinion of CTE students. This research found the teachers believed CTE students to be: (a) followers of specific career paths, (b) occasionally failing academically, (c) enjoyed real-world learning experiences, and (d) highly technology-driven students. Teachers viewed non-CTE students to be: (a) academically motivated, (b) focused on content, not theory, (c) excelled in traditional educational areas like mathematics and English, and (d) had more capabilities in a greater number of academics areas (Handy & Braley, 2012). It is important to note that 54 teachers, 32 counselors, and 24 administrators participated in this study which may have slightly skewed these results as there are typically fewer CTE teachers and administrators in any given school system.

The participants in the Handy and Braley (2012) study are not the only individuals who view CTE students as underachieving. Scott and Sarkees-Wircenski (2008) found that many individuals held the belief that CTE programs only prepare students for low-paying jobs. In addition to this notion, many individuals are simply advocates for a four-year postsecondary education. However, Gray, Wang, and Maliza (1995) found that about half of high school

students are not prepared to enter college. They suggested that students enter CTE programs that can provide career training and skills to enter the workforce. More importantly, the authors note that CTE training programs do not prevent students from obtaining a college education, but rather provides training for a career until the time a student is prepared to excel in a four-year college classroom. Although, with the new CTE programs, a student may never need to enter the college classroom, as he or she is already trained in a high-demand field.

As referenced above, President Obama, the Alabama Senate, and many others have stated the importance of CTE fields as in-demand jobs continue to grow. To best prepare students for success in the classroom and later on in the workforce, educators must understand the needs, values, skills, and goals of their students. Upon understanding these needs, values, skills, and goals, CTE curricula can be tailored to students through meaningful programs and courses that offer students real-world activities and engaging discussions in high-demand fields.

Theoretical Framework

As this study focuses on the work values and technology skills of community college students enrolled in one or more CTE courses, the theoretical framework is formed from the achievement goal theory in which motivation and behaviors can vary in different people and different circumstances (Maehr, 1984). Thus, the motivation for each student at the community college may be different than that of his or her peers'. For instance, the goal of obtaining a degree or certificate would be the same for two degree-seeking students, but the motivation for that may be different. One student may be completing a degree to begin a career while another student may be completing a degree to display the importance of education to his or her children.

Many theories have been developed in an attempt to understand why individuals perform in a certain manner, specifically in an academic setting. In response to the development of social

cognitive theories and goal content theories that attempt to understand why some individuals perform better academically, researchers began to develop theories focused on achievement goals. According to Pintrich and Schunk (1996), achievement goals are the reasons people attempt to achieve a task. Achievement goals typically focus on academic tasks, but can be applied to any context, including business tasks or athletic tasks. The aforementioned social cognitive theories and goal content theories can apply to any context or goal; however, achievement goals may only be applied to achievement motivation and behaviors (Pintrich & Schunk, 1996). Since the achievement goal theory focuses on achievement motivation and behaviors, it can vary in different situations and individuals (Maehr, 1984). Thus, for the purpose of this study, the achievement goal theory will focus on work values and technology skills of students because values and skills act as the motivators for the achievement of obtaining a degree or certificate.

According to Maehr and Zusho (2009), there are four assumptions of achievement goal theory: (1) motivation is a process, (2) competence is at the heart of goal theory, (3) goals create motivational systems, and (4) goals and self-related processes are intertwined (pp. 79-81). Motivation is thought of as a process because students have different behaviors in regards to "activities, level and quality of task engagement, persistence, and performance" (p. 79). "Emphasis is placed on the process of learning, and on understanding the factors, both personal and contextual, that influence how an individual approaches, engages in, and responds to achievement-related situations" (Maehr & Zusho, 2009). The second assumption of achievement goal theory, that competence is at the heart of goal theory, is of importance because individuals must be competent to survive in his or her environment. According to this assumption, it is assumed that an individual acquires the skills and behaviors needed to perform routine, normal

tasks for his or her environment. Under the assumption that goals create motivational systems, Elliott and Dweck (1988) suggested the following:

> … that each of the achievement goals runs off a different 'program' with different commands, decisions rules, and inference rules, and hence, with different cognitive, affective, and behavioral consequences. Each goal, in a sense, creates and organizes its own world – each evoking different thoughts and emotions and calling forth different behaviors. (p. 11)

The final assumption of the achievement goal theory assumes that goals and self-related processes are intertwined concerns of self-awareness. Achievement goals may be adopted based on what people want to become or do not want to become in the future (Maehr & Zusho, 2009, p. 81). If individuals strongly want to achieve a goal or avoid failing at a goal, then they will be more motivated to succeed.

According to Pintrich (1999), "goal orientation is often used to represent the idea that achievement goals … represent a general orientation to the task that includes a number of related beliefs about purposes, competence, success, ability, effort, errors, and standards" (p. 94). Thus, individual and personal characteristics, such as values and skills, can influence achievement goals (Pintrich, 1999). Very rarely do two individuals have identical goals or aspirations; hence, achievement goal theory can apply to any goal an individual may want to achieve in the short- or long-term. The goal orientation emphasizes two types of goals: mastery goals and performance goals. Mastery goals "focus on acquiring and developing competence" while performance goals "focus instead on demonstrating one's competence and outperforming others" (Senko, Hulleman, & Harackiewicz, 2011, p. 27). Mastery goals and performance goals focus on the acquisition of skills in an intrinsic manner. Mastery-avoidance and performance-avoidance goals focus on the

acquisition of skills in an extrinsic manner. Mastery-avoidance orientation is the "lack of mastery or failure to learn as much as possibly" and the performance-avoidance orientation "describes students who wish to avoid looking incompetent, lacking in ability, or less able than their peers" (Wolters, 2004, p. 236).

Statement of the Problem

Providing students with the best education possible, an education that will ensure employment upon graduation or completion of training, has been a priority for educators and government officials for many years. This is even more accurate since the Great Recession, an event that changed the economic landscape not only in America, but also throughout the world. Arne Duncan (2014), United States Secretary of Education, recently stated, "CTE programs provide instruction that is hands-on and engaging, as well as rigorous and relevant. Many of them are helping to connect students with the high-demand science, technology, engineering and math fields – where so many good jobs are waiting" (p. 2). In an effort to provide guidance or prepare students for the workforce, the USDE (2012) released a blueprint to ensure that CTE programs offer coursework that ensures students acquire the skills needed for "in-demand occupations within high-growth industry sectors" (p. 2). The blueprint will be discussed in greater detail in chapter two. The Alabama Community College System's (ACCS) (2014) Office of Workforce Development stated that the office aims "to provide Alabama an efficient and effective workforce development system responsive to current and future needs of individuals and businesses" (Mission section, para. 1). In doing so, the office provides students with the skills and training needed for current and future employment needs while avoiding layoffs and unemployment (ACCS, 2014). The goal of Alabama CTE "is to provide students access to a flexible system of rigorous school- and work-based learning planned collaboratively by students,

parents, educators, and employers" (Alabama State Department of Education (ALSDE), 2013). More importantly, the Alabama State Department of Education (ALSDE) curriculum "provides individually-based and hands-on learning experiences for students" with "technology … used to support and customize course content to match student learning styles, experiences, and skills" (2013, About Us section, para. 5).

With the spotlight, from the federal government and multiple state departments and organizations, on CTE and the economic predictions that the job market will continue to be strong in the CTE fields, it is imperative that students are equipped with the skills and values demanded by employers. There are many rigorous CTE programs that provide students with the skills needed to obtain employment in high-demand fields. However, there is an ongoing challenge to maintain alignment between curriculum standards and the rapid advancement in employer expectations concerning employees' skills. Students enrolled in a CTE program at a community college should enter the workforce with not only the skills needed to gain employment, but with the traits employers want their employees to possess. There is currently no such emphasis on developing students' work values and technology skills to ensure successful employment after completion of a CTE program. Thus, this study will address the problems that exist due to the lack of information related to work values and technology skills of students enrolled in a CTE program at a community college in a Southeastern state and the lack of information related to any possible correlation between student work values and technology skills.

Significance of the Problem

This study is valuable to CTE program coordinators and instructors at the community college level as it will provide insight concerning current work values and technology skills of

students enrolled in one or more CTE courses at a community college. In turn, this information may be used to develop courses and coursework that will assist students in developing the work values and skills, specifically technology skills, identified by industries, in the literature review, as being necessary for successful employment.

Purpose of the Study

This study was designed to investigate: (a) the work values; (b) the technology skills concerning software, hardware, and technology tools; (c) the perceived competency level to complete basic computer tasks; and (d) the correlation between work values and technology skills of students enrolled in one or more CTE courses at a community college in a Southeastern state. The purpose of this study is to provide information that may be utilized to improve CTE programs at the community college level so that students will graduate with not only the skills, but also the work values needed to excel in a chosen field.

Research Questions

The following research questions were designed to address the statement of the problem:

1. What are the demographic characteristics of the students enrolled in one or more career and technical education courses at a community college in a Southeastern state in terms of (a) gender, (b) age, (c) ethnicity, and (d) degree program?
2. To what extent do students enrolled in one or more career and technical education courses at a community college in a Southeastern state differ in their overall work values across degree program?
3. What is the rank order of overall work values of students enrolled in one or more career and technical education courses at a community college in a Southeastern state?

4. To what extent do students enrolled in one or more career and technical education courses at a community college in a Southeastern state differ in their perceived competency to use (a) hardware technology, (b) software technology, and (c) technology tools based on degree program?
5. To what extent do students enrolled in one or more career and technical education courses at a community college in a Southeastern state perceive that they need further development of skills concerning (a) software technology, (b) hardware technology, and (c) technology tools based on degree program?
6. To what extent do students enrolled in one or more career and technical education courses at a community college in a Southeastern state perceive that they can complete basic computer tasks without assistance?
7. To what extent is there a correlation between overall work values and technology skills of students enrolled in one or more career and technical education courses at a community college in a Southeastern state?

Definitions of Terms

Altruistic Work Values – Work values that focus on an individual's concern for others or society; individuals with high altruistic work values receive great joy or pleasure from helping others (Marini, Fan, Finley, & Beutel, 1996).

Career and technical education (CTE) – education programs at the secondary and post-secondary levels that develop academic, employability, and job-specific skills for employment (ACTE, 2014)

CIP-skills – Soft skills relating to communication, integration, and presentation skills that are desirable by employers, especially in high-growth fields (Anderson & Gantz, 2013).

Cloud – Virtual storage and delivery of resources such as files or software that optimizes security and reduces storage costs (Intel, 2014). Dropbox and iCloud are examples.

Extrinsic Work Values – Work values that focus on an individual's concern for external motivators; individuals with high extrinsic work values are motivated by extrinsic rewards such as money or status (Marini et al., 1996).

Hardware – A term for the physical equipment of the computer or related equipment such as a monitor, keyboard, or mouse (Morrison & Wells, 2013).

Internet – The world's largest network of networks and devices, often used as a communication tool (Morrison & Wells, 2013).

Intrinsic Work Values – Work values that focus on an individual's concern for internal motivators; individuals with high intrinsic work values are motivated by intrinsic rewards such as learning new skills or ability to be creative at work (Marini et al., 1996).

Microsoft Office Specialist (MOS) – Certification that demonstrates skills and abilities utilizing the Microsoft Office suite. Available for Microsoft Office 2007, 2010, and 2013 in Word, Excel, PowerPoint, Access, Outlook, OneNote, and SharePoint (Certiport, 2014).

Prestige Work Values – Work values concerning the importance of having respect, prestige, and status in the workplace (Elizur, 1984; Ros, Schwartz, & Surkiss, 1999). Subset of extrinsic work values.

Social CRM – The use of social media by businesses to engage and enhance customer relationships (Goldenberg, 2015).

Social Work Values – Work values that focus on an individual's concern for social motivators; individuals with high social work values are motivated by social rewards such as making friends at work or the opportunity to engage with lots of people (Marini et al., 1996).

Software – A term for programs or instructions that allow computers to operate properly (Morrison & Wells, 2013).

Technology Tools – Tools created to solve recognized problems or make tasks simpler for those performing the tasks on a regular basis (Srite & Karahanna, 2006).

Video Sharing – The ability to share files with others using a website or software. YouTube is an example (Morrison & Wells, 2013).

Web Conferencing – A software that allows for the ability to attend meetings virtually from any location with Internet access. GoToMeeting and Zoho Meeting are examples (Morrison & Wells, 2013).

Work Values – The behaviors and beliefs of individuals in the workplace that dictate actions. Encompasses core values, work environment values, work interaction values, and work activity values (Zytowski, 1970; Super, 1980).

Limitations

Limitations are the conditions beyond the control of the researcher that may place restrictions on the conclusions of the study and their applications to other situations. Limitations in this study include: (a) number of students responding to the survey; and (b) use of a self-reporting survey instrument.

Delimitations

Delimitations are the boundaries beyond which the study is concerned. This study involved only students at a single community college in a Southeastern state.

II. REVIEW OF LITERATURE

The review of literature consists of the following major sections:

Introduction

Brief History of Work Values

Brief History and Changes of Technology in Business

The Work Values of Students and Employees

Technology Trends in Business

Importance of Technology Skills

Computer Literacy at Community Colleges

Summary

Introduction

Employers believe the United States' workforce is inadequately prepared for current and future in-demand jobs (Casner-Lotto, Barrington, & Partnership for 21st Century Skills, 2006). Nevertheless, according to the Chancellor's Report for the ACCS, the greatest factor influencing Alabama's recovery from the economic downturn is having a high-skilled workforce to fill jobs. By 2018, 63% of all jobs will require postsecondary training or education (ACCS, 2012); however, only 45% of community college students currently earn a degree or certificate within six years of starting a program (Center for Community College Student Engagement (CCCSE), 2012). Moreover, according to the Survey of Entering Student Engagement (SENSE), 66% of entering community college students need remedial work in at least one area. This number increases to 72% for entering community college students who completed the Community

College Survey of Student Engagement (CCSSE) (CCCSE, 2012). In a report released by CCSSE (2012), Vincent Tito, Distinguished Professor at Syracuse University, stated, "If we are going to make a substantial dent in completion rates, we must ask, 'How can we reshape students' experience in the one place where they will be while they are on campus: in the classroom?'" (p. 2).

The ability to increase the number of completed certificates or degrees at the community college was once only considered a concern, but is now of greatest urgency. Having highly skilled, well-prepared graduates is essential for sustaining not only the national economy, but local economies as well (CCCSE, 2012). According to USDE (2012), the blueprint for preparing career and technical education students for entering the workforce has four principles: (1) alignment, (2) collaboration, (3) accountability, and (4) innovation which would create a better aligned education to workforce flow.

According to the USDE (2012), alignment will be improved by allowing individual states to identify high-demand fields and then creating clear academic and skill expectations for entering the fields. Better collaboration will exist when industry and schools work more closely to design academic programs and when secondary and postsecondary CTE programs work together to ensure student success. The blueprint stated that programs would have meaningful accountability when skills are "based upon common definitions and clear metrics for performance" (2012, p. 3). Accountability occurs when states have the ability to identify and fund high-demand programs, when uniform definitions are used and data allows for meaningful comparisons, and rewards are offered to programs exceeding expectations (USDE, 2012). Lastly, the USDE blueprint for the career and technical education transformation states, "Increase[d] emphasis on innovation supported by systemic reform of state policies and practices to support

CTE implementation of effective practices at the local level" (p. 4). For this innovation to take place, policies must be in place throughout the state at local levels to provide support and guidance, and new and innovative models at the local level must guide change at a higher level (USDE, 2012). "These high-quality CTE programs would give students the skills they need to be successful and businesses the skilled workforce they need to thrive" (p. 15).

To ensure Alabama's over 77,000 community college students who are enrolled in the more than one hundred and fifty CTE programs (ACCS, 2012, p. 12) are prepared to enter the workforce, continual audits of programs for curriculum development must be completed. Audits of degree and certificate programs are necessary because community colleges serve a much more diverse population in terms of traditional and non-traditional students than four-year colleges. According to Amy Glass (2007), differences in life experiences of students result in different views, values, expectations, skills, and preferences. With many individuals in the workforce preparing to retire, those expected to take these retirees' positions must be prepared "to meet workplace demands in an increasingly complex, knowledge- and technology-based, global economy" (Casner-Lotto et al., 2006, p. 7). To equip students with the values and skills they will need to successfully enter the workforce, degree and certificate programs at the community college level must ensure students have basic knowledge/skills and applied skills (Casner-Lotto et al., 2006).

According to the report by Casner-Lotto, Barrington, and Partnership for 21st Century Skills (2006), applied skills are of greater importance to employers than basic skills as applied skills "enable new entrants to use the basic knowledge acquired in school to perform in the workplace" (p. 1). Applied skills such as teamwork/collaboration, creativity/innovation, social responsibility, critical thinking/problem solving, and diversity may be linked to work values. For

example, individuals who ranked the attribute "creative" as very important in the Marini, Fan, Finley, and Beutel (1996) study would value a job where they could express themselves creatively more than a job where creativity was not a reward for the job.

Applied skills also include information technology application (Casner-Lotto et al., 2006). Information technology application is the ability to "select and use appropriate technology to accomplish a give task, apply computing skills to problem-solving" (p. 16). According to a study by Lucia Baillie (2000), more than 50% of employers stated that Microsoft Office was the most useful technical skill for recent information technology graduates. A report released by Certiport (2008) stated that individuals in administrative or back-office support positions may spend as much as 80% of their workday utilizing Microsoft Office. Thus, having the proper technical skills is integral for success in the workplace for degree and certificate seeking community college students.

Brief History of Work Values

To properly analyze the history of work values, researchers must first understand the concept of values. Allport (1961) first defined values as beliefs that are responsible for actions concerning preferences. According to Dose (1997), "Values are standards, but attitudes are not" (p. 2) in the sense that attitudes can change depending on the situation, but values remain constant across situations. Elizur and Saige (1999) also believed that one must first understand values to understand work values, as work values are a subcategory of values. Given that values are constant, researchers agree that the study of work values began and continues due to concerns for motivation, conflict, performance, communication, and managerial actions. Moreover, work values allow researchers to better understand individuals' preferences, specifically those concerning working environment (Dose, 1997).

Although there is no singular agreed upon definition of work values, it is imperative to have a broad understanding of the definition to fully comprehend the history of work values. Zytowski (1970) defined work values as "a set of concepts which mediate between the person's affective orientation and classes of external objects offering similar satisfaction" (p. 176). Conversely, Super (1980) defined work values as "an objective, either a psychological state, a relationship, or material condition, that one seeks to attain" (p. 130). This section will focus on specific research measures to provide a brief history of the study of work values.

The Minnesota Importance Questionnaire (MIQ) was developed by James Rounds, George Henly, Jr., Ren Dawis, Lloyd Lofquist, and David Weiss in 1967 (Puccio & Murdock, 2007). The questionnaire was created to understand factors that increase levels of job satisfaction and focuses on six work values: altruism, achievement, autonomy, comfort, safety, and status (Leuty & Hansen, 2011). These six work values are analyzed across the following twenty vocational dimensions: ability utilization, achievement, activity, advancement, authority, company policies and practices, compensation, co-workers, creativity, independence, moral values, recognition, responsibility, security, social service, social status, supervision-human relations, supervision-technical, variety, and working condition (Gay, Weiss, Hendel, Dawis, & Lofquist, 1971). The MIQ can be offered as either a comparison of pairs test or as a ranked test with a score ranging from -4.0 to 4.0. Work values with scores ranging from -4.0 to 0 are considered unimportant and work values with scores ranging from 0 to 4.0 are considered important (Gay et al., 1971). Although the MIQ is one of the oldest work values questionnaires, it is still widely used today due to its dependability concerning vocational needs (Dawis, 2001).

Another measure of work values, The Work Values Inventory (WVI) was developed by Donald Super as a follow-up to his previous research concerning career patterns (Leuty &

Hansen, 2011). The latest version of this instrument consists of the following 12 scales: achievement, coworkers, creativity, income, independence, lifestyle, mental challenge, prestige, security, supervision, work environment, and variety (Robinson & Betz, 2008). Results have shown expectable similarities and differences across genders leading Super (1970) to conclude that work values satisfy needs and the similarities or differences across genders underscore the theory that multiple occupations can meet the needs of an individual (Dose, 1997). Furthermore, Super (1970) determined that individuals differences in values, interests, skills, self-concepts, and personality prepare individuals for multiple occupations, but the skills of the individual help to narrow the choices.

The Work Values Inventory (WVI), developed by Manhardt (1972), focused on job characteristics. Although there is little evidence as to how the characteristics were selected, the original study consisted of 25 job characteristics. After analysis of the items, three factors emerged. Meyer, Irving, and Allen (1998) later confirmed and labeled the three factors: Comfort and Security, Competence and Growth, and Status and Independence. According to Leuty and Hansen (2011), comfort and security are characterized by "a comfortable working environment including having a routine schedule, leisure time, and good relationships with coworkers" (p. 380). The second factor, competence and growth, is characterized by "the importance of responsibility, advancement, and supervision of others" (p. 380). The third and final factor, status and independence, is characterized by "independence, continued development of skills, and intellectual stimulation" (p. 380). Manhardt's Work Values Inventory (MWVI) is of importance as it asks a range of questions, at the item level, that are not included in other work values measures. For example, the MWVI asked respondents if they valued employment that

"permit[ted] a regular routine in time and place of work" (p. 380) concerning comfort and security.

Beyond the major measures listed above, there are other minor, lesser known measures concerning work values. The Work Aspect Preference Scale developed by Pryor contained 13 values scales (Pryor, 1981). This measure is of importance due to inclusion of physical activity values and detachment values, values not included in other measures (Leuty & Hansen, 2011). Ronen's Taxonomy of Needs identifies 14 needs concerning work – advancement, area, autonomy, benefits, challenge, coworkers, earnings, manager, physical, recognition, security, skills, time, and training (Ronen, Kraut, Lingoes, & Aranya, 1979). Ronen's Taxonomy of Needs is of importance for the inclusion of benefits and area.

According to Leuty and Hansen (2011), recent research concerning work values has been limited due to termination of work values research programs, a shortage in relevant literature, and researchers' development of measures for single studies rather than for vast use. Due to these limitations, researchers are utilizing decades old measures of work values which require researchers to question whether younger generations have different work values than their predecessors or if the domain of work is transitioning (Jurkiewicz, 2000).

Brief History and Changes of Technology in Business

Technology has been part of the workforce for more than 100 years, but the rapid technological changes of today are exponential compared to those of the past. According to O'Neill (2013), there are three distinct periods of technology transition. The first period was from 1900 to 1979 and was the period of standardized platforms. The development of technologies was slow with color photography being introduced in 1907, the electric typewriter in 1919, the computing machine concept in 1937, the digital computer in 1943, the silicon chip

in 1958, the computer mouse in 1963, the tablet personal computer and laptop concept in 1968, electronic mail and floppy disk in 1971, and the personal computer and mobile phone in 1973 (O'Neill, 2013). During this time, 54% of the United States' economic output consisted of the production and delivery of material goods. This type of production did not require large amounts of technology as most employees were considered factory jobs (Apte, Karmarkar, & Nath, 2008). More importantly, however, the use of technologies such as typewriters lowered the cost of processing and distributing information while simultaneously increasing the demand for education or skilled workers (Frey & Osborne, 2013).

The second period of technology transition was from 1980 to 1999 and was characterized by individualized technologies. These individualized technologies allowed users for the first time to have unique experiences with the technology, unlike previous inventions where the use of the technology was homogenous. During the individualized period, development was much quicker with the introduction of the laptop in 1982, the camcorder in 1983, Microsoft Windows in 1985, World Wide Web (WWW) in 1990, Digital Video Disc (DVD) in 1995, and Google in 1998 (O'Neill, 2013). According to O'Neill (2013), the standardized platforms period and the individualized technology period were times of top down implementation meaning "technology decisions were made at the enterprise level and all employees used the same limited number of devices, applications, and platforms" (p. 3). During this time, information products became the United States' largest output, representing 63% of total output. This change exhibits the growth in the reliance of technologies in businesses from production companies to stock traders (Apte et al., 2008). Furthering businesses reliance on technology was the 37% yearly decrease through 1980 and a 64% yearly decrease during the 1980s and 1990s in computation making these

technologies available to all businesses, not just large companies with great wealth (Frey & Osborne, 2013).

The third period of technology transition, characterized by consumerized technologies, began in 2000 and continues to this day. These consumerized technologies are devices that have blended personal and business applications. The development of technologies during this period is the fastest in history. The consumerized period's technological inventions include: the iPod in 2001, Facebook in 2004, Blu-Ray and Twitter in 2006, the iPhone in 2007, cloud computing in 2008, and the iPad in 2010 (O'Neill, 2013). In more recent years, there has been less of an introduction of new products and more of a focus on the abilities of already developed products. For instance, Instagram has become a major social networking tool for businesses, yet it can be accessed through a smartphone or personal computer. According to JT Ripton (2016), the focus of business technology is currently centered on security, payment, wearables, and the cloud. Businesses want information to be secure from a business perspective, but also want the data of customers to also be secure. Furthermore, wearable devices such as the Apple Watch allow for continuous connectivity and real-time updates. These wearable devices and smartphones allow for a new form of payment, payment via device. No longer do individuals need a card or cash to pay for an item as the wearable device contains account information which allows for instant payment. Lastly, the cloud continues to be an integral technology concerning the business sector. According to Rupton (2016) approximately 93% utilizes the cloud for software applications. Moreover, the cloud allows for greater connectivity as individuals are not limited by file size when utilizing the cloud. In this period, implementation of technologies is top down and grass roots meaning, "businesses observe that people want to use their own devices and can do so

effectively" so businesses are deciding "that it is more expedient and productive to support them" (p. 3).

According to Daniel Newman (2012), as we look to the future, technology will continue to transform the workplace and the individuals who work within the workplace. The greatest change to the workplace is a distributed workforce, meaning employees do not have to live locally to work for a company as technologies make it possible to complete projects remotely. Due to this change, employees must have the ability to utilize conferencing and telecommuting software. Employees must have the ability to utilize social media. Newman (2012) stated, "To capture, track, store, and utilize the raw data, Social CRM will further revolutionize how we interact with the web to better the workplace. All of the major players … are integrating social into their platforms" (p. 2). According to Barton Goldenberg (2015), Social CRM (customer relationship management) is the use of social media to engage and manage relationships with customers such as pushing coupons via Facebook or answering questions concerning a product via Twitter. A concern of future technologies for employees is the ability of technologies to perform cognitive tasks; in the past technologies have performed manual tasks; however, with the advent of technologies such as Siri, cognitive tasks may soon become computerized (Frey & Osborne, 2013). As we move forward, technologies are only going to become more prevalent and perform more tasks, and the ability to properly utilize these technologies is going to be of greater and greater importance if an individual is going to be gainfully employed.

The Work Values of Students and Employees

In a society where individuals are not only living longer, but are also working longer, it is integral to understand the differences in the current workforce and those

who will soon to be entering the workforce. Understanding the differences in values can allow employers to hire employees whose values match those of the company and help employers to better manage current employees (Cennamo & Gardner, 2008). Roe and Ester (1999) stated, "Holders of values are not necessarily individuals but may also be collectivities, i.e. the people belonging to a certain occupational group, a firm, a subculture, a community, a national category, or a country" (p. 4). These groups are often individuals with similar ages, ethnicities, genders, or life experiences. Furthermore, work values change and mature and individuals mature so it is necessary to continue research to ensure there is an alignment of employee and employer values (Smola & Sutton, 2002).

Work Values of Different Generations

Kupperschmidt (2000) defined a generation as an "identifiable group that shares birth years, age location, and significant life events at critical developmental stages" (p. 66). Currently in post-secondary schools and the workforce are three main generations: Baby Boomers, Generation X, and Generation Y. According to Cennamo and Gardner (2008), it is often hard to specify exact generation changes as research is limited to Canada, the United States, and the United Kingdom; however, the following years provide ranges for the generations: Baby Boomers (born 1946-1961); Generation X (born 1962-1979); Generation Y (born 1980 forward) (p. 892).

Cherrington, Condie, and England (1979) stated,

> If age is significantly related to work values, even when the effects of income, education, sex, seniority, and occupational level are controlled, then the differences in the work values of older and younger workers might be attributed to the kind of socialization process they have experienced. (p. 618)

Baby Boomers are classified as optimistic, being born in a happy time in American history, directly after World War II. Individuals born during Generation X years are collectively identified as selfish or independent as they were raised during a period of financial and social insecurity (Jurkiewicz, 2000). According to Cennamo and Gardner (2008), members of Generation Y often seek a balanced life of work and play, which can be attributed to the advent of the Internet.

Baby Boomers

Cennamo and Gardner (2008) conducted a study to determine the differences in job satisfaction, organizational commitment, and work values of Baby Boomers, Generation X, and Generation Y (p. 891). Participants completed a 20-minute questionnaire to determine these differences. Generational differences were found on status values ($F(2, 465) = 5.53$, $p < 0.001$, partial $\eta^2 = 0.03$), thus Baby Boomers did not value status work values as much as Generation X and Generation Y (Cennamo & Gardner, 2008, p. 898). Furthermore, the study found differences in freedom work values ($F(2, 465) = 3.54$, $p < 0.05$, partial $\eta^2 = 0.02$) (p. 898). Baby Boomers desired freedom values less than Generation Y. Freedom values are a part of extrinsic work values focusing on when and how individuals work. Specifically, the ability to work from home or have a flexible work schedule. Cennamo and Gardner (2008) determined "that higher status and longer tenure mean that these requirements have been met and these work values are no longer salient for older groups, whereas younger responders are still striving for status and autonomy at work" (p. 898).

Generation X

Through a nationwide survey of over 3,000 participants, Cherrington, Condie, and England (1979), conducted a study to identify differences in work values according to age.

Respondents answered using a seven point Likert-type scale, with choices ranging from 1 = strongly disagree to 7 = strongly agree. Multiple regression equations were used to assess relationships between work values and age, seniority, education, income, sex, and occupational experience (pp. 618-620). Results concluded that older workers identified intrinsic work values of moral importance and pride as being of greater importance than extrinsic work values such as money or importance (Cherrington, Condie, & England, 1979).

Smola and Sutton (2002) replicated the study completed by Cherrington et al. (1979) to compare Generation X and Generation Y work values. A similar Likert-type scale was used in survey that was only altered to reflect changes in attitudes toward specific societal norms such as gender. Data analyses concluded that Generation X wanted to receive promotions more quickly than Baby Boomers ($F = 4.42$, $p < 0.05$). Furthermore, Generation X believed that hard work makes an individual a better person ($F = 6.48$, $p < 0.05$), while Baby Boomers believed that work should be one of the most important parts of an individual's life ($F = 6.09$, $p < 0.05$) (p. 376). Generation X value self above others, thus, are thought to put themselves before the company and are much more self-centered than Baby Boomers; however, the study concluded that Generation X has a more idealistic view of work in that hard work is an indicator of self-worth.

Generation Y

Duffy and Sedlacek (2007) conducted a study to determine the work values of first-year college students. The study consisted of a survey instrument containing questions concerning: work values, parental income, and educational aspirations (Duffy & Sedlacek, 2007). Participants identified prestige, high salary, contributions to society, and intrinsic interest as the four most important work values (p. 359). Students planning to only obtain an undergraduate degree chose intrinsic work values as most important compared to students planning to obtain

advanced degrees, who chose prestige work values as most important (Duffy & Sedlacek, 2007). According to Elizur (1984) and Ros, Schwartz, and Surkiss (1999), prestige work values concern the importance of having respect, prestige, and status in the workplace.

Conversely, Cherrington et al. (1979), concluded that younger workers identified extrinsic work values pertaining to "money, importance of friends over work, and the acceptability of welfare as an alternative to work" (p. 622) to be of greater importance than intrinsic work values. Cennamo and Gardner (2008) obtained similar results as the researchers concluded that Generation Y valued status work values and freedom work values.

Work Values of Different Genders

As women became more liberated in the latter half of the previous century, more emphasis was put on gender equality, specifically in the workplace. Shifts in work place roles and familial roles began with women's liberation and have continued to this day (Marini et al., 1996), making the subject of gender work values a widely studied subject.

Researchers have found conflicting results as to the work values of men and women. Pryor (1983) concluded these conflicting results in the research concerning values to be present because men are more concerned about long-term career goals including money, security and independence while women are more concerned about short-term career goals including comfortable working environment and coworkers. Clark (1997), however, speculated these differences are a result of job satisfaction; "objectively, women's jobs are worse than men's," thus, "women's higher job satisfaction reflects their lower expectations, which themselves likely result from the poorer position in the labour market that women have held in the past" (p. 342).

Marini et al. (1996) conducted a study of high school seniors from 1976 to 1991 to determine differences in work values of males and females. The researchers hypothesized that

the work values of males and females were converging as women were working more and often in the same jobs as men. The study analyzed 23 work values across seven categories: extrinsic rewards, intrinsic rewards, altruistic rewards, social rewards, influence, leisure, and security (Marini et al., 1996, pp. 54-55). Respondents answered using a four point Likert-type scale, with choices being: 1 – not important, 2 – a little important, 3 – pretty important, 4 – very important. Results concluded that men and women, equally, value extrinsic rewards and influence, values that had previously been valued more by men. Both males and females also value "intrinsic, altruistic, and social rewards of work;" (Marini et al., 1996, p. 62) however, these rewards are more greatly valued by women. Females prefer work that allows a direct impact on individuals and society, work that allows friendships and contact with individuals, and work that allows females to be themselves and use their skills (Marini et. al., 1996). Overall, while there are differences between males and females, as more women have entered the workforce, the work values of the genders have become more similar.

Weisgram, Bigler, and Liben (2010) found similar results in two studies concerning work values of children, adolescents, and adults across gender. In the first study the researchers used a survey to determine participants' values and whether male and female values were different. Group differences were then analyzed using a mixed-effects ANOVA using a Bonferonni correction for any significant interactions. The interaction between age, sex, and values was significant ($F(6, 918) = 4.12$); follow-up analyses were significant among adolescents and adults. Females valued altruistic values more than males in the adolescent and adult age categories and adult females valued family values more than males.

In the second study, Weisgram et al. (2010) wanted to confirm previous research that stated that same-sex individuals have a higher interest in careers where the majority of

employees are of the same sex due to individuals within a specific sex having similar values. The researchers hypothesized that “males would be more interested in jobs that were depicted as affording money and power than would females, whereas females would be more interested in jobs that were depicted as affording family and altruistic values than would males” (Weisgram, Bigler, & Liben, 2010, p. 788). Results showed that adolescents and adults, but not children, link values of money and power together and altruism and family together. Adolescents and adults also linked specific values to gender dominated careers; careers that have more females are identified as valuing family values more than careers dominated by men. Men and women respondents were both more interested in jobs identified as high in money (extrinsic value) over power and family; however, women were not more interested in jobs identified as high in money over jobs identified as having altruistic values. Male respondents valued family and power over altruistic values, thus the major values difference between males and females being altruistic values (Weisgram et al., 2010).

Work Values of Different Ethnicities

According to Glass (2007), the current workforce is the most culturally diverse in United States history. Cultures, as defined by Guiso, Sapienza, and Zingales (2006), are “those customary beliefs and values that ethnic, religious, and social groups transmit fairly unchanged from generation to generation (p. 23). Within a specific culture, individuals may hold certain values, cultural values, that in addition to work values may guide individuals in choosing careers (Brown, 2002). Carter and Cook (1992) stated that "from a cultural frame of reference, work is a functional aspect of life in that individuals contribute their skills and labor to their cultural societies and the maintenance of their families" (p. 199), thus individuals from different cultures will likely have different goals and values within a career.

Ng and Sears (2010) hypothesized that minority group members would self-report high levels of extrinsic, social, and altruistic work values while majority group members would self-report high levels of intrinsic work values. The researchers formulated these hypotheses because minority group members have often experienced discrimination and needs going unfilled in the past, thus are more motivated to succeed. For this study, majority group members were defined as white males and minority group members were defined as ethnic minorities and women (Ng and Sears, 2010). Responses were gathered using an internet-based survey with a five point Likert-type scale with 1 = not at all important and 5 = essential distributed as part of a broader research project. MANCOVAs were used to analyze responses where ethnicity, gender, and work values were the reported variables while controlling for program of study of the respondents. Ethnic minority group members ($F(1, 2685) = 29.01$, $p < .001$) and women ($F(1, 2685) = 5.19$, $p < .05$) reported higher extrinsic work values than white men. Ethnic minorities reported higher intrinsic work values ($F(1, 2685) = 20.15$, $p < .001$) than white males. As hypothesized, ethnic minorities ($F(1, 2685) = 22.37$, $p < .001$) and women ($F(1, 2685) = 4.26$, $p < .05$) self-reported higher social work values than the majority. Lastly, ethnic minorities ($F(2, 2685) = 22.37$, $p < .001$) and women ($F(2, 2685) = 17.54$, $p < .001$) reported higher altruistic work values (Ng and Sears, 2010, p. 686).

Much like the research conducted by Ng and Sears (2010), Kashefi (2011) sought to determine if, as stated in previous research, Blacks had lower work values than Whites or if Blacks and Whites now had similar work values since the previous research was dated. Kashefi (2011) utilized the work values and job rewards data from the 2006 General Social Survey (GSS). Respondents answered using a Likert-type scale with 5 = strongly agree. Kashefi was able to collect a total of 3,918 responses; 3,284 (72.8%) White and 634 (14.1%) Black. The low

response rate by participants identifying as Black could be a viewed as a limitation to the research.

Analysis concluded that Whites intrinsic work values (7.41) were higher than Blacks, but Blacks extrinsic, relational (social), and enhancement work values were significantly higher than Whites (Kashefi, 2011). A regression model was utilized to explain variation in extrinsic work values. The variable race (-0.177) was negative suggesting that Blacks value extrinsic rewards more than Whites and the variable education (-0.142) was negative validating that Whites undervalue extrinsic rewards. Concerning intrinsic work values, the race variable (0.153) suggests that Whites value intrinsic rewards more than Blacks, and the education variable (0.284) suggests that the more educated one is, the more he or she values intrinsic rewards. Kashefi determined that relational (social) work values are dependent on how much an individual likes his or her job. The race variable (-0.057) suggests Blacks value relational work values more than Whites and the education variable (0.038) suggests education is not a factor in relational work values. When again analyzing with post-entry structural factors of workplace contribution (0.258), social contribution (0.122), and enjoy job even if money is not needed (0.130), the race variable is non-significant (-0.054) adjustments are made to work values to meet demands of the job. The race variable (-0.171) suggests that Blacks value enhancement work values more than Whites. However, more educated individuals of both races (-0.132) are less likely to value enhancement work values. The race coefficient (-.0206) and the education coefficient (-0.142) are statistically significant meaning the greater the opportunity for enhancement, the more important the enhancement reward. Lastly, concerning age (-0.044) meaning older employees do not value enhancement values as much as their younger counterparts (Kashefi, 2011).

According to Kashefi (2011), "Whites attach significantly higher value to intrinsic rewards, while Blacks display significantly higher extrinsic, relational, and enhancement work values" (p. 657). While the work values of Whites and Blacks are still significantly different, Blacks work values have evolved over time. However, in high-status positions, Blacks and Whites have the same extrinsic, intrinsic, and relational work values, but significantly differing enhancement work values (Kashefi, 2011).

Technology Trends in Business

According to Eric Roberts (1998), Professor of Computer Science at Stanford University, "The technological advances achieved in the past few decades have brought about a revolution in the business world, affecting nearly all aspects of a working life" (p. 1). Furthermore, Deloitte's annual report of technology trends coined the current technological environment in the workplace as the postdigital era. The report stated, "The postdigital era, like the post-industrial era, reflects a 'new normal' for business and a new basis for competition" (White & Briggs, 2013, preface). This "new normal" is the required knowledge of and use of technology rather than the preference to use technology. According to Ouye (2011), this adoption of new technologies and workstyles does not impact the workplace, but rather how employees work. According to Sandy Short (2014) of *EHS Today*, The Society for Industrial and Organizational Psychology recently identified workplace trends of 2014 including many technology trends. These trends include: alternatives to full-time work, telework, social media, work-life balance, integration of technology in the workplace, gamification, new ways to test, the talent question, increasing efficiency, and big data.

According to Newman (2012) there are six trends currently transforming the workplace: distributed workforce, de-materialization/mobility, consumerization, social 3.0 – search and

CRM, and unified communication. Hiring a Distributed workforce is the practice of hiring the best candidate despite geographical location due to technologies that allow the individual to perform the job in a timely and accurate manner. Technologies that make this possible include collaboration technologies and cloud tools. Consumerization has created a backwards flow of technology from consumers to businesses, thus, businesses are required to understand smart devices such as iPads. According to Norris and Soloway (2014), Social 3.0 is "software (sites and apps) [that] supports synchronous collaboration, i.e., real-time, simultaneous, collaboration" (p. 2). This is different from the Web 2.0 of the past where there was asynchronous collaboration, or collaboration with a "delay". Moreover, Social 3.0 includes apps as many computer software programs now have a smartphone application version. Businesses must understand and utilize social media as consumers are less reliant on media and more reliant on suggestions and postings on social media by friends (Newman, 2012).

According to a report by Ipsos Public Affairs (2006), the United States' Census Bureau stated that 64% of individuals 18 years or older are currently employed and, of those individuals, 56% use a computer at work as of 2003. Moreover, in the workplace trends study, which had 711 participants, researchers determined the required technologies of workers with the question "I'm going to read out a list of requirements and resources that people may or may not require to do their job effectively. Please tell me which, if any, you need to do your job?" (Ipsos, 2006, p. 12). Possible responses included: printer, Internet, email, regular communications with colleagues, personal computer, appropriate space, copier, traditional telephone, regular communications with clients, high-speed Internet, access to company network, access to specialized software, cell phone, scanner, wireless capabilities, laptop, PDA. Respondents identified printers (94%), Internet (93%), email (92%) regular communications with colleagues (92%), personal computer

(90%), and appropriate space (90%) as the top six most important technologies or resources needed to successfully complete work tasks (Ipsos, 2006, p. 12).

The workplace trends study also determined downsides of technology in the workplace. When given a list of possible issues arising from technology use at work, respondents identified increase in information/communication (66%), keeping up to date with the latest technology (56%), system failures (51%), overuse of the printer/paper waste (50%), and employees/colleagues conducting personal business (47%) as the top five issues arising from technology use (Ipsos, 2006, p. 16). According to Ipsos (2006), technology in the workplace "has resulted in extremely positive outcomes for both the employer and the employee. Employers have benefitted from leaps in productivity while employees now enjoy greater flexibility over where and when they work and find the experience more rewarding" (p. 4).

While this study is slightly dated, it is relevant because it analyzed data from respondents rather than utilizing forecasts from technology experts or magazines that does not release quantifiable data. Furthermore, businesses utilize technology as needed within the industry so it is rare for current research to analyze technology trends across multiple business sectors like the Ipsos study. Moreover, the research that is available traditionally lists general trends, like Ouye's (2011) research concerning technology trends in the workplace. Ouye (2011) states there are five trends currently changing work including: (1) the continuing distribution of organizations; (2) the availability of enabling technologies and social collaboration tools; (3) the coming shortage of knowledge workers; (4) the demand for more work flexibility; (5) pressure for more sustainable organizations and workstyles (p. 1).

Importance of Technology Skills

The National Association of Colleges and Employers (NACE) (2014) recently released a report that stated 7.8% more graduates will find jobs than those graduating in 2013, and when accounting for international employment opportunities, the outlook for 2014 graduates improves to 12%. However, even as early as the 1980s, researchers began predicting the importance of technology skills to employment. In addition, Mary Vanis (1989) stated that a new definition of literacy was developed because "basic computer literacy would become essential for employees to keep pace with the rapid automation of the manufacturing industry" (p. 13). According to Certiport (2008), a leader in standards-based certification solutions, 70% of the workforce are information workers. Anderson and Gantz (2013) technology is making its way into many jobs that are not tradition IT jobs including inventory management, hospitality, manual labor, food service, and many more; thus, employees must understand and have the ability to utilize technologies.

NACE recently completed the job outlook research for 2014 graduates. In this study, NACE surveyed employer members of the organization concerning employee-related issues and hiring projections. A limitation of this study is the low response rate as only 208 participants (19.8%) returned a completed survey (National Association of Colleges and Employers (NACE), 2014). To determine what employers seek in job applications, a five-point Likert-type scale question was developed with 1 = Not at all important, 2 = Not very important, 3 = Somewhat important, 4 = Very important, and 5 = Extremely important. While the ability to work in a team structure response was rated the most important attribute of potential employees with an average response rating of 4.55, four responses concerning technology skills was ranked somewhat important to very important. The four responses are: ability to obtain and process information

(4.37), ability to analyze quantitative date (4.25), proficiency with computer software programs (3.94), and ability to create and/or edit written reports (3.62).

In a recent research study, the International Data Corporation (IDC) examined job postings to determine the skills requirements that employers are seeking in job applicants. After examining over 14.6 million job postings, the IDC determined there are more than 12,000 job-specific skills across occupations and more than 1,000 skills needed across high-growth/high-wage occupations (Anderson & Gantz, 2013). Anderson and Gantz (2013) determined the most common required skills are "oral and written communication skills, attention to detail, customer service focus, organizational skills, and problem-solving skills" (p. 6). More notably, Microsoft Office is the number three of the top 20 required skills desired by employers. "These technologies are important because they are widely required capabilities across a broad range of occupations" (Anderson & Gantz, 2013, p. 6).

The IDC further found that CIP-skills are listed in approximately 40% of all job postings and 70% of all job postings requiring one of more of the top 20 required skills. Anderson and Gantz (2013) report, "that IDC considers proficiency in Microsoft Office to be a CIP-related skill because Microsoft Office is a fundamental enabler for critical communication and presentation skills" (p. 10). The IDC also found that Microsoft Office was an explicit skill demanded by employers in 15% of high-growth/high-salary positions, the most required skill of the top 20 required skills. More importantly, Anderson and Gantz (2013) found that 29% of future high-growth/high-salary positions would require Microsoft Office skills. These findings indicated the importance of Microsoft Office skills for the foreseeable future.

Baillie's (2000) research study found similar results to the IDC study concerning IT employers' demands, except the primary Microsoft Office programs preferred were Access and

PowerPoint, not Word and PowerPoint. Baillie interviewed 50 supervisors from an array of business sectors throughout the country to determine supervisors preferred skills on future employees. When asked what technical skills were useful, more than 50% of respondents named Microsoft Office. Baillie also determined that supervisors preferred individuals with industry certification. Lastly, based on respondents' answers, employers preferred potential candidates that have technical and business skills to a potential employee that only has technical knowledge (Baillie, 2000).

According to research completed by Cushing Anderson (2007) for the IDC an improvement in the selection process of potential hires can reduce turnover and create a competitive advantage for a company, especially when the selection process incorporates an assessment of technology literacy. Research states that 15% of new administrative hires are fired within the first year and 80% of those lasting longer than one year are low performers. Moreover, 75% of administrative positions require moderate to advanced Microsoft Office skills, thus showing the importance of technology skills in the workplace (Anderson, 2007). Screening for or requiring new hires to complete Microsoft Office Specialist (MOS) certification is beneficial to both employer and employee. According to the IDC, MOS-certified employees are more capable of completing tasks without supervision, are valued employees both within and outside the company, and most importantly, MOS-certified employees "play an important role in setting the work process standards" (Anderson, 2007, p. 6) within the company. The IDC believes that the importance of tests, specifically tests concerning computer skills will increase in importance to employers throughout the selection process and employment period of future job candidates as businesses become less structured and the use of technologies continues to grow (Anderson, 2007).

Hart Research Associates (2013) conducted an online survey of 318 businesses and organizations with at least 25 or more employees and have at least 25% of employees who have obtained a two- or a four-year degree. Respondents to the survey were upper level management including presidents, vice presidents, chief executive officers, and owners at non-profit and private businesses. The online survey questioned respondents on what college students must do to thrive in the current economy. While the study did not directly focus on technology, there are results that are of particular importance. When asked if less, more, or the same emphasis should be placed on 17 selected learning outcomes, 78% of respondents believed "The ability to apply knowledge and skills to real-world settings" needed more emphasis; 72% of respondents believe "The ability to locate, organize, and evaluate information from multiple sources" needed more emphasis; and 56% of respondents believed "Knowledge about science and technology" needed more emphasis (Hart Research Associates, 2013, p. 8). Furthermore, 83% of respondents stated that an electronic portfolio would be considered very (43%) or fairly (40%) useful in determining applicants' skills (Hart Research Associates). These results further display the importance of technology skills.

The Northern Virginia Community College Office of Institutional Research (2000) completed a study to determine characteristics and skills valued by employers. The research was conducted in a two phase process: (1) telephone survey of selected businesses gathering quantitative and qualitative data and (2) mail survey delivered to 10,000 businesses. The response rate is a limitation of this study at 16% as only a total of 1,621 telephone and mail surveys were completed and returned. The survey had employers rank and discuss employee characteristics and skills. When simply ranking characteristics, employers ranked special technical skills eleventh with a standard mean of 3.64 and computer skills tenth with a standard

mean of 3.64, both low rankings since the study only reviewed 17 characteristics and skills. However, when considering the IDC's aforementioned interpretation of CIP-skills, communication abilities was ranked second with a standard mean of 4.59 and the ability to learn on the job was ranked third with a standard mean of 4.50, both key to successfully understanding and utilizing technologies in the workplace, and both highly ranked by employers.

Computer Literacy at Community Colleges

While colleges, both universities and community colleges alike, agree computer literacy is integral for student success, there is significant disagreement on what technology skills are of most value to students and how to best teach these skills (Dodge, 2001). Former United States Secretary of Education, Rob Page, stated,

> America's prosperity in the 21st century rests largely upon the success of our education system to equip citizens with the knowledge and skills needed to thrive in our global economy. As innovation drives economic growth, it is incumbent upon us to explore innovative means of improving learning and instruction. (News Report, 2003, p. 1)

Furthermore, Under Secretary of Commerce and Technology, Phillip Bond stated that he believed the American workforce is the key to competitiveness in the knowledge-based economy (News Report, 2003). According to Dr. Charles Finn (2004), "Digital literacy is a means for ascertaining the competency of an individual to function in the workplace. It will become increasingly necessary to be digitally literate to function in a digital economy" (p. 6).

Paula Zeszotarski (2000) stated, "The ability to use computer technology and to evaluate electronic information has become a basic skill for community college students in both academic and occupational programs" (p. 2). Since community colleges are an instrumental part of

providing trained individuals to the workforce, community colleges will "play a key role in developing computer skills needed for success" (Finn, 2004, p. 6).

Lucy Dodge (2001) completed a study to determine the success of institutionalizing basic computer skills at the community college level at a specific site. The goals and objectives of the institutionalizing basic computer skills were to: (1) integrate fundamental computer technology courses into the college curriculum; (2) train teachers and students in basic computer-related technology skills; (3) develop lab facilities where computer skills can be consistently practiced and reinforced; (4) define and promote a common set of technology skills across courses and programs; (5) assist faculty in developing curriculum materials; (6) use local department strategies to support computer use in classrooms; (7) increase student retention so that students remain to complete certificate or degree program; (8) close the gap between technology skills of students and skills required in the current job market; (9) infuse technology skills into instructional backbone of the institution (Dodge, 2001).

To determine the effectiveness of this program, Dodge created a 25 pre- and post-test survey for technology courses. The survey utilized a five-point Likert-type scale with A = I have never done this before, B = I did this task once or twice before; C = I have done this tasks several times before, D = I have done this task many times and feel very comfortable doing this task, and E = I am very experienced with this task (Dodge, 2001). The pre-test average rating for all skills was 2.2, while the post-test average rating for all skills was 4.3, thus institutionalizing of basic computer skills program was successful. Furthermore, only 19% of respondents on the pre-test felt comfortable or experienced utilizing the surveyed technologies while 81% of respondents felt comfortable or experienced at the end of the course. While this 81% is a drastic increase in

digital literacy, only 38% of original respondents completed the course meaning retention may be the greatest challenge in teaching digital literacy to students (Dodge, 2001).

In another study, Kuo, Miller, and Hagie (2003) sought to determine the study skills and technology ability differences of community college and four-year university students. The survey was completed by 319 respondents from seven community colleges and two four-year universities. The survey utilized a six-point Likert-type scale with 1 = strong disagreement and 6 = strong agreement. The results showed that community college students agreed more to the utilization of technology than four-year university students. Community college respondents agreed to strongly agreed to typing schoolwork (M = 5.08), utilizing a computer for school (M = 4.99), utilizing a computer for personal reasons (M = 4.85), using the Internet (mean 4.89), utilizing email (mean 4.50), and completing research online (M = 4.43). Conversely, four-year university respondents agreed to strongly agreed to only two used: utilizing a computer for school (M = 4.32) and utilizing a computer for personal reasons (M = 4.01). Lastly, the survey found that neither community college students nor four-year university students agreed with writing their own computer programs or utilizing personal data assistance technology (Kuo, Miller, & Hagie, 2003).

Summary

The literature reviewed indicated differences in work values among demographic factors. Previous researchers have found differences in work values based on: sex, age, ethnicity, and other demographic factors; however, there are two major issues with the literature concerning work values. The first issue is the development of survey instruments for a single study (Leuty & Hansen, 2001). According to Jurkiewicz (2000), this forces researchers to either use decades old survey instruments or develop an instrument for a single survey, a method that has been

criticized by fellow researchers. The second issue is the lack of funding in recent years, which may have led to a gap in the research.

The literature reviewed further revealed that technology is integral to business and educational functions. According to Ispos Public Affairs (2006), appropriately 56% of the workforce utilizes a computer to complete tasks while Certiport (2008) reports that 70% of the workforce are information workers. While researchers have found varying percentages of technical skills utilized in the workforce, Anderson and Gantz (2013) found that out of 12,000 job-specific skills, the ability to properly utilize Microsoft Office is the third most desired skills. Dodge (2001) found that a basic computer skills program at the community college level increase students' abilities and comfort level concerning utilizing technologies. Kuo et al. (2003) found that community college students strongly agreed to utilizing a computer for school and to type schoolwork; however, is this enough to properly prepare students to enter the workforce with the required technology skills? According to Zeszotarski (2000), "Access to technology improves access to educational opportunities" (p. 2) and access to educational opportunities improves access to in-demand careers.

Previous research did not include studies that explored the connection between work values and technology skills. Research, however, indicated ethnicity to be a predictor of technology adoption (Srite & Karahanna, 2006) as well as other demographic factors including: age (Morris & Venkatesh, 2000), experience (Davis, Bagozzi, & Warshaw, 1989) and gender (Venkatesh & Morris, 2000). There was no study found on the competence level to utilize software at a job, the competence level to utilize hardware at a job, or the competence level to utilize technology tools at a job for students enrolled in a CTE program at a community college. Furthermore, no study was found on the perceived development needs of technical skills

necessary for employment for students enrolled in a CTE program at a community college. Lastly, no study was found on the perceived competence level of students in their ability to complete computer related tasks. Therefore, the focus of this study was to investigate the work values, technology, and the possible correlation between the two concerning community college students enrolled in one or more CTE courses.

III. METHODS AND PROCEDURES

Introduction

The focus of this study was to determine the perceived work values of students enrolled in one or more career and technical education (CTE) courses at a community college in a Southeastern state. This study also examined the technology skills of the population. Furthermore, the study determined if there was a correlation between technology skills and work values of students enrolled in one or more CTE courses.

Permission to conduct this study was granted from the Auburn University Institutional Review Board (Appendix A). Researchers at Auburn University, where the study was conducted, must obtain permission from the Institutional Review Board (IRB) to use the response of human subjects. Protocol, a request for exempt status, an information letter, and a copy of the survey instrument was forwarded to the IRB for approval prior to the survey being sent to the participants. Permission was also granted by the participants in the form of a completed survey.

Population

The participants for this study were the students enrolled in one or more CTE courses at a community college in a Southeastern state. The 2014 – 2015 community college student directory provided the roster of names and e-mail addresses. A total of 886 emails were sent asking for participation. At the conclusion of data collection, 225 surveys were returned. This sample (N = 225) included all students enrolled in one or more CTE courses at a community college the semester the survey was approved for dissemination. This study was conducted including the entire population of interest as a census without utilizing any sampling techniques.

Instrumentation

Data was collected through a researcher-designed survey entitled Values and Skills of Community College Students (VSCCS) (Appendix B). The researcher developed the survey instrument after an appropriate instrument was not revealed in the review of literature; however, the literature was used to develop the survey questions. The survey instrument included the following components: (a) Section I: Demographics; (b) Section II: Work Values; (c) Section III: Technology Skills; (d) Section IV: Other.

The demographic data in Section I included: gender, age group, ethnicity, and current degree program, and number of semesters enrolled in current degree program. Section II of the survey instrument included information concerning overall work values; specifically, this section focused on intrinsic work values, extrinsic work values, social work values, and altruistic work values. This section contained two questions. In the first column of the question 2a, students were provided a prompt concerning specific work value attributes. In the second column, students were asked to identify their importance level of the prompt when considering a job/career. A five point Likert-type scale was utilized for this question with the following scale: Very Unimportant; Unimportant; Neither Important or Unimportant; Important; Very Important. An optional Not Applicable option was added for instances where the prompt did not apply to the respondent.

Items 1 – 14 in question 2a were developed to measure overall work values of students enrolled in one or more CTE courses at a community college in a Southeastern state. Items developed to measure overall work values when considering a job/career included:

1. Opportunity to advance quickly
2. High salary/income

3. High social status
4. Respect from others
5. Ability to utilize skills and abilities
6. Ability to be creative
7. Job is interesting
8. Opportunity to learn new skills
9. Opportunity to work with friends
10. Opportunity to make friends
11. Opportunity to socialize
12. Ability to work alone
13. Opportunity to help others
14. Ability to benefit society as a whole

Question 2b in this Section II: Work Values required students to rank fourteen prompts in order of most important (1) to least important (14) related to the most desirable criteria when you seek a job/career. The following prompts in this question concern overall work values:

1. Opportunity to advance quickly
2. High salary/income
3. High social status
4. Respect from others
5. Ability to utilize skills and abilities
6. Ability to be creative
7. Job is interesting
8. Opportunity to learn new skills

9. Opportunity to work with friends
10. Opportunity to make friends
11. Opportunity to socialize
12. Ability to work alone
13. Opportunity to help others
14. Ability to benefit society as a whole

Section III of the survey instrument included information regarding technology skills of students enrolled in one or more CTE courses at a community college in a Southeastern state. This section contained five questions. The first question (3a) sought to determine students' competence to utilize software on the job, the second question (3b) sought to determine students' competence to utilize hardware on the job, and the third question (3c) sought to determine students' competence to utilize technology tools on the job. In the first column of each of these questions, students were provided a specific software, hardware, or technology tool. In the second column, students were asked to identify their self-perceived competence level concerning the specified software, hardware, or technology tool. A four point Likert-type scale was utilized for each of these questions with the follow scale: No Competence; Basic Competence; Moderate Competence; Expert Competence. The fourth question in this section (3d) sought to determine students' development needs concerning software, hardware, and technology tools. In the first column of this question, students were provided a specific software, hardware, or technology tool. In the second column, students were asked to select whether they need further development or do not need further development concerning the software, hardware, or technology tool. The fifth question in this section (3e) sought to determine students' competence concerning computer tasks. In the first column of this question, students were provided a computer task. In the second

column, students were asked to identify (1) Yes, they could complete the computer task without assistance or (2) No, they could not complete the computer task without assistance.

Items 1 – 33 were developed to measure competence in: Microsoft Word, Microsoft Excel, Microsoft PowerPoint, Microsoft Outlook, the Internet, and general computer tasks of students enrolled in one or more CTE courses at a community college. Items developed to measure computer tasks competence included:

1. Utilize Spell Check to edit documents
2. Create a table in Microsoft Word
3. Create Headers and Footers in Microsoft Word
4. Complete a Mail Merge in Microsoft Word
5. Save a Microsoft Word document as a different file type
6. Create formulas in Microsoft Excel
7. Edit formulas in Microsoft Excel
8. Create Macros in Microsoft Excel
9. Create a PowerPoint presentation
10. Add transitions to a PowerPoint presentation
11. Add videos to a PowerPoint presentation
12. Add a link in a PowerPoint presentation
13. Create an email in Microsoft Outlook
14. Add an attachment to an email in Microsoft Outlook
15. Create a signature for an email in Microsoft Outlook
16. Create a folder in Microsoft Outlook
17. Add contacts in Microsoft Outlook

18. Open a link in a new window in a web browser
19. Clear browser cache in a web browser
20. Edit URLs to navigate in a web browser
21. Create bookmarks/favorites in a web browser
22. Utilize Boolean operators in a search engine
23. Manually run a virus scan of a computer
24. Run a disk defragmentation
25. Empty the Recycle Bin
26. Complete a copy/paste using shortcuts
27. Complete a cut/page using shortcuts
28. Verify physical connectivity to a network
29. Determine your IP address
30. Create a folder on the desktop
31. Zip/Compress a folder/file
32. Unzip/Decompress a folder/file
33. Change a folder/file name

Section IV: Other of the survey contained one open-ended question that allowed students to list any factors that contributed in them enrolling at the specific community college in the Southeastern state.

Participants received an informational e-mail explaining the purpose of the survey, the need for the study, and the importance of participation. A readable font style and format was used. Specific directions for responding and submitting answers for each section were clear and direct.

The survey process included: an information letter (e-mail) (Appendix C), as required by the Auburn University Institutional Review Board, describing the study to the potential participant and outlining the procedures to be followed in completing the survey. This information e-mail included a link to the survey via Qualtrics.

Data was collected anonymously. No IP addresses or e-mail addresses were collected during the delivery or submission of the survey instrument. Responses were maintained on a secure database provided by Qualtrics.

Validity and Reliability

The foundation for the items of the survey was derived from the research objectives and the review of literature. The areas included in the review of literature focused on topics such as the brief history of work values, brief history and changes of technology in business, the work values of students and employees, technology trends in business, importance of technology skills, and computer literacy at community colleges.

To ensure the content validity and usability of the scores from the survey instrument, a panel of expert university faculty members were used to evaluate the content. The panel was chosen based on their knowledge and experience concerning descriptive survey research design, survey instruments, and/or data collection. The panel of experts were asked to review the survey instrument for clarity of directions, concepts, and definitions.

Cronbach's alpha determines internal consistency reliability by determining the correlation of survey instrument items (Gay, Mills, & Airasian, 2009). Cronbach's alpha was used in this study to determine reliability coefficients for the following sections of the research instrument: overall work values of students enrolled in one or more CTE courses at a community college and perceived competency of hardware, software, and technology tools. Cronbach's

alpha ranges from 0 to 1, with 1 indicating perfect reliability and 0 indicating no reliability, thus, reliability coefficients for each scale suggested that the items had high internal consistency. The results are shown in Table 1.

Table 1

Reliability of Scales

Item	N	Cronbach's alpha
Perceived Competence		
Hardware Technology	14	.947
Software Technology	10	.918
Technology Tools	12	.920
Overall Work Values	14	.947

Data Collection

Each member of the population received an e-mail including (a) information letter describing the study; and (b) a link to the survey instrument.

The respondents were asked to complete the survey within a two-week time period. Since submissions were anonymous, each member of the sample received a follow-up e-mail asking for their help in completing the survey if they had not already done so. Participants were only contacted once through the use of follow-up.

A total of 886 emails were sent asking for participation. At the conclusion of data collection, 225 surveys were returned, which resulted in a 25.4% participation rate.

Data Analysis

Statistical treatment of the data included the use of the Statistical Package for Social Sciences (SPSS) 22.0. Descriptive statistics were used to analyze, organize, summarize, and describe the collected data.

Research questions one, three, and six were analyzed using descriptive statistics to determine percentages and frequency counts. According to Green and Salkind (2011), descriptive statistics summarize data by creating numerical expressions and graphical illustrations.

Research questions two, four, and five were analyzed using higher-way analysis of variance (ANOVA) tests. In research question two, the ANOVA tests were used to determine the difference in overall work values and degree programs. Research question four used the ANOVA tests to determine the difference in perceived competency of students enrolled in one or more CTE courses at a community college to use hardware technology, software technology, and technology tools and degree programs. Research question five used the ANOVA tests to determine the difference in perceived need for further development of hardware, technology, and technology tools skills and degree programs. According to Green and Salkind (2011), ANOVA tests are the appropriate tests because there is an independent variable, with multiple levels, and a dependent variable, and the ANOVA will test for significant differences between the means.

Research question seven was analyzed using the Pearson product-moment correlation coefficient (Pearson r) to determine if there was a correlation between overall work values and technology skills of students. Green and Salkind (2011) explained that the Pearson product-moment correlation coefficient analyzes data to determine if a linear relationship exists between two variables.

IV. STATISTICAL ANALYSIS AND RESULTS

Introduction and Restatement of the Problem

This study was designed to provide information regarding the work values of students enrolled in one or more CTE courses at a community college in a Southeastern state, identify software skills, hardware skills, and technology tools skills, as well as the perceived competency level concerning basic computer skills of the population. Reviewed literature in Chapter II revealed the necessity for understanding work values and technology skills of students at the community college level who will soon enter the workforce. This chapter presents the analysis of the data collected for students enrolled in one or more CTE courses at a community college in a Southeastern state utilizing the researcher-developed Values and Skills of Community College Students (VSCCS) instrument.

Descriptive Data Analysis and Results

Descriptive statistics, including frequencies and percentages, were conducted in SPSS to summarize, organize, and describe the data. The descriptive data were used to answer research questions one and five.

Research Questions

Question 1: What are the demographic characteristics of the students enrolled in one or more career and technical education courses at a community college in a Southeastern state in terms of (a) gender, (b) age, (c) ethnicity, and (d) degree program?

The first section of the Values and Skills of Community College Students (VSCCS) instrument was used to address research question one. Demographic characteristics for students

were summarized by gender, age group, ethnicity, and degree program. The majority of respondents were female (71.3%). The most common reported age category was 20-29 years of age (42.9%). The largest percent of respondents were Caucasian (52.9%). The highest reported degree program was other (29.5%) which were identified to be the General Studies degree programs. Gender had 44 missing responses resulting in an n= 181; Age had 34 missing responses resulting in an n = 191; Ethnicity had 36 missing responses resulting in an n = 36; Current degree program had 35 missing responses resulting in an n = 190. The results are shown in Table 2.

Table 2

Demographic Data Reported by Students

Item	f	%
Gender		
Male	52	28.7
Female	129	71.3
Age Group		
Less than 20 years of age	28	14.7
20-29 years of age	82	42.9
30-39 years of age	38	19.9
40-49 years of age	34	17.8
50-59 years of age	7	3.7
60-69 years of age	2	1.0
Ethnicity		
African-American	71	37.6
Asian	4	2.1
Caucasian (White)	100	52.9
Hispanic/Latino	3	1.6
Other	11	5.8

(Table continues)

(Table 2 continued)

Demographic Data Reported by students

Item	f[a]	%
Degree Program		
HVAC	4	2.1
Automotive Manufacturing	2	1.1
Maintenance	1	.5
Business	9	4.7
Accounting	10	5.3
Banking and Finance	1	.5
Management and Supervision	18	9.5
Small Business Management	4	2.1
Administrative Technology	5	2.6
Legal Administrative Technology	1	.5
Medical Administrative Technology	9	4.7
CISCO Networking	7	3.7
Information Technology	9	4.7
Criminal Justice	8	4.2
Fire Science	8	4.2
Medical Assisting	4	2.1
Nursing (ADN)	26	13.7
Nursing (Mobility)	2	1.1
Multimedia Graphic Design	4	2.1
Simulation and Modeling	2	1.1
Other	56	29.5

[a] n = 181, 191, 189, 190

Research Question 2: To what extent to do students enrolled in one or more career and technical education courses at a community college in a Southeastern state differ in their overall work values across degree program?

The second research question was analyzed using higher-way analysis of variance (ANOVA) tests to ascertain the difference in overall work values based on degree program of the students. Due to the response rate, degree programs were collapsed into three groups: (1) Workforce Development, (2) General Studies, and (3) Health-Related. The degree programs within the Workforce Development group included: Applied Technology: Air Conditioning and Refrigeration, Applied Technology: Automotive Manufacturing, Applied Technology: Industrial Maintenance, Applied Technology: Sustainable Construction/Renewable Energy, Business and Office Technology: Administrative Technology, Business and Office Technology: Legal Administrative Technology, Business and Office Technology: Medical Administrative Technology, Computer Information Systems: CISCO Networking, Computer Information Systems: Information Technology, Criminal Justice, Fire Science, Homeland Security, Visual Communications: Multimedia Graphic Design, and Visual Communications: Simulation and Modeling. The degree programs within the General Studies group included: Business, Business: Banking and Finance, Business: Management and Supervision, Business: Small Business Management, and Other. The degree programs within the Health-Related group included: Medical Assisting, Nursing (ADN), and Nursing (Mobility).

Participants responded to the work values items on a five-point Likert-type scale ranging from one to five with five indicating very important, four indicating important, three indicating neither important or unimportant, two indicating unimportant, and one indicating very unimportant. An additional item was added for situations where the item was not applicable to

the participant. The work values items listed were: opportunity to advance quickly, high salary/income, high social status, respect from others, ability to utilize skills and abilities, ability to be creative, interesting job, opportunity to learn new skills, opportunity to work with friends, opportunity to make friends, opportunity to socialize with others, ability to work alone, opportunity to help others, and ability to benefit society as a whole. Due to missing degree program answers n = 110 rather than the stated N = 225. The mean scores and standard deviations for differences in students' overall work values are shown in Table 3.

Table 3

Mean Scores and Standard Deviations for Overall Work Values based on Degree Programs

Item	M[a]	SD
Degree Programs Group		
Workforce Development	57.89	10.50
General Studies	57.43	6.93
Health-Related	57.07	14.46

[a] n = 110

There were no statistically significant differences in overall work values of students based on their degree programs group [$F(2, 107) = .053$, $p = .949$].

Research Question 3: What is the rank order of overall work values of students enrolled in one or more career and technical education courses at a community college in a Southeastern state?

The third research question was analyzed using frequency tests to ascertain the rank order in overall work values of the students enrolled in one or more career and technical education courses at a community college in a Southeastern state.

Participants ranked 14 work values items from 1 to 14 with one indicating most important and 14 indicating least important. The work values items listed were: opportunity to advance quickly, high salary/income, high social status, respect from others, ability to utilize skills and abilities, ability to be creative, interesting job, opportunity to learn new skills, opportunity to work with friends, opportunity to make friends, opportunity to socialize with others, ability to work alone, opportunity to help others, and ability to benefit society as a whole. The two highest reported work values were high salary/income (24.7%) and opportunity to advance quickly (22.2%). The least important work values were opportunity to make friends (.6%) and opportunity to socialize with others (.6%). Due to missing responses, n = 158 for this research question. The frequency for each rank of overall work values for students enrolled in one or more CTE courses at a community college in a Southeastern state are shown in Table 4. In addition, the mean scores and standard deviations are shown in Table 5.

Table 4

Frequency for Each Rank of Overall Work Values of Students

Item	Frequency for Each Rank[a]													
Work Value	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
Opportunity to advance quickly	35	32	25	15	13	8	7	6	4	3	1	4	3	2
High Salary/Income	39	37	18	12	14	6	7	7	1	2	4	1	1	9
High Social status	2	2	18	8	7	13	3	7	10	4	5	14	22	43
Respect from others	11	12	19	32	14	13	11	14	19	5	3	1	2	2
Ability to utilize skills and abilities	8	14	18	20	36	21	20	11	3	2	2	2	1	0
Ability to be creative	3	8	4	5	14	25	22	19	20	19	5	5	6	4
Interesting job	22	9	17	21	16	21	21	14	9	3	3	1	1	0
Opportunity to learn new skills	3	9	12	12	18	22	20	30	14	10	5	2	0	1
Opportunity to work with friends	0	0	3	2	0	4	4	4	25	25	32	26	20	13
Opportunity to make friends	0	1	1	2	2	1	7	10	19	40	34	21	12	8
Opportunity to socialize with others	0	1	0	3	4	2	7	9	9	23	39	32	23	6
Ability to work alone	4	1	1	2	5	4	8	7	9	7	9	31	31	39
Opportunity to help others	19	16	12	15	6	10	8	10	10	5	9	9	24	5
Ability to benefit society as a whole	12	16	10	9	9	8	13	10	6	11	7	9	12	26

[a] n = 158

Table 5

Reported Importance of Work Values when Considering a Job/Career

Item	M[a, b]	SD
Work Value		
Opportunity to advance quickly	4.31	.991
High Salary/Income	4.33	.963
High Social status	3.22	1.244
Respect from others	4.22	1.129
Ability to utilize skills and abilities	4.51	1.023
Ability to be creative	4.16	1.094
Interesting job	4.45	1.043
Opportunity to learn new skills	4.48	1.040
Opportunity to work with friends	3.42	1.204
Opportunity to make friends	3.75	1.182
Opportunity to socialize with others	3.68	1.154
Ability to work alone	3.54	1.077
Opportunity to help others	4.35	1.014
Ability to benefit society as a whole	4.37	1.020

[a] n = 168 [b] 5 = Very Important, 4 = Important, 3 = Neither Important or Unimportant, 2 = Unimportant, 1 = Very Unimportant

Research Question 4: To what extent do students enrolled in one or more career and technical education courses at a community college in a Southeastern state differ in their perceived competency to use (a) hardware technology, (b) software technology, and (c) technology tools based on degree program?

The fourth research question was analyzed using higher-way analysis of variance (ANOVA) tests to ascertain the difference in students' competency to utilize (a) hardware technology, (b) software technology, and (c) technology tools based on degree program. The following items were grouped before analysis to create a single score for hardware technology: Tablet, Digital Camera, Digital Video Camera, Webcam, Laptop, Scanner, Headphone, Microphone, USB/Flash Drive, Router, Smartphone, Smartboard, GoPro Camera, 3D Printer, and Smart Watch. Items grouped before analysis to create a single score for software technology were: Microsoft Word, Microsoft PowerPoint, Microsoft Excel, Microsoft Access, Microsoft Outlook, Video Editing Software, Photography Editing Software, Web Page Design Software, Antivirus Software, and Accounting Software. The following items were grouped before analysis to create single score for technology tools: Internet, Cloud, Web Conferencing, Video Sharing, Facebook, Twitter, Instagram, Vine, Social Media Management, Customer Relationship Management, Email Marketing, and Organization.

Hardware Technology

Participants responded to the hardware technology items on a four-point Likert-type scale ranging from zero to three with three indicating expert competence, two indicating moderate competence, one indicating basic competence, and zero indicating no competence. The hardware technology items listed were: Tablet, Digital Camera, Digital Video Camera, Webcam, Laptop, Scanner, Headphone, Microphone, USB/Flash Drive, Router, Smartphone, Smartboard, GoPro

Camera, 3D Printer, and Smart Watch. A total score for each participant could range from 15 to 60 for the 15 items related to hardware, with the highest possible mean value of 30. Due to missing responses, n = 99 for hardware technology competency. The mean scores and standard deviations for differences in students' competency to utilize hardware technology are shown in Table 6. The mean scores and standard deviations for hardware are shown in Table 7.

Table 6

Mean Scores and Standard Deviations for Hardware Technology Competence Based on Degree Programs

Item	M[a]	SD
Degree Programs Group		
Workforce Development	41.84	11.24
General Studies	40.33	9.53
Health-Related	42.37	9.85

[a] n = 99

Table 7

Perceived Competence to Use Hardware Technology

Item	M[a, b]	SD
Hardware		
Tablet	3.20	.849
Digital Camera	3.19	.825
Digital Video Camera	3.09	.892
Webcam	2.89	1.037
Laptop	3.40	.734
Scanner	2.99	.948
Headphone	3.49	.751
Microphone	3.23	.881
USB/Flash Drive	3.43	.789
Router	2.76	1.041
Smartphone	3.46	.759
Smartboard	2.48	1.119
GoPro Camera	2.07	1.121
3D Printer	1.82	1.091
Smart Watch	1.91	1.117

[a] n = 150 [b] 5 = Very Important, 4 = Important, 3 = Neither Important or Unimportant, 2 = Unimportant, 1 = Very Unimportant

Results showed no statistically significant differences for students' competency to utilize hardware technology based on their degree programs group [$F(2, 96) = 2.384$, $p = .098$].

Software Technology

Participants responded to the software technology items on a four-point Likert-type scale ranging from zero to three with three indicating expert competence, two indicating moderate competence, one indicating basic competence, and zero indicating no competence. The software technology items listed were: Microsoft Word, Microsoft PowerPoint, Microsoft Excel, Microsoft Access, Microsoft Outlook, Video Editing Software, Photography Editing Software, Web Page Design Software, Antivirus Software, and Accounting Software. A total score for each participant could range from 10 to 40 for the 10 items related to hardware, with the highest possible mean value of 20. Due to missing responses, n = 98 for software technology competency. The mean scores and standard deviations for differences in students' competency to utilize hardware technology are shown in Table 8 and the mean scores and standard deviations for software are shown in Table 9.

Table 8

Mean Scores and Standard Deviations for Software Technology Competence based on Degree Programs

Item	M[a]	SD
Degree Programs Group		
Workforce Development	23.28	7.01
General Studies	20.85	5.71
Health-Related	25.86	8.13

[a] n = 98

Table 9

Perceived Competence to Use Software Technology

Item	M[a, b]	SD
Software		
Microsoft Word	3.23	.734
Microsoft PowerPoint	3.08	.850
Microsoft Excel	2.62	.902
Microsoft Access	2.34	.904
Microsoft Outlook	2.63	.942
Video Editing Software	1.85	.964
Photography Editing Software	1.91	.972
Web Page Design Software	1.70	.934
Antivirus Software	2.09	1.019
Accounting Software	1.73	.887

[a] n = 150 [b] 5 = Very Important, 4 = Important, 3 = Neither Important or Unimportant, 2 = Unimportant, 1 = Very Unimportant

Results showed statistically significant differences for students' competency to utilize software technology based on their degree programs group [$F(2, 95) = 3.554$, $p = .032$]. Follow-up tests were conducted to evaluate pairwise differences. There was a significant difference in competency to utilize software technology between students enrolled in General Studies degree programs and students enrolled in Health-Related degree program ($p = .028$). The mean score for students within the General Studies degree programs group was 20.85 compared to the mean score of 25.86 for students within the Health-Related degree programs group, with standard deviations of 5.71 and 8.13 respectively.

Technology Tools

Participants responded to the technology tools on a four-point Likert-type scale ranging from zero to three with three indicating expert competence, two indicating moderate competence,

one indicating basic competence, and zero indicating no competence. The software technology items listed were: Internet, Cloud, Web Conferencing, Video Sharing, Facebook, Twitter, Instagram, Vine, Social Media Management, Customer Relationship Management, Email Marketing, and Organization. A total score for each participant could range from 12 to 48 for the 12 items related to hardware, with the highest possible mean value of 24. Due to missing responses, n = 99 for technology tools competency. The mean scores and standard deviations for differences in students' competency to utilize technology tools are shown in Table 10 and the mean scores and standard deviations for technology tools are shown in Table 11.

Table 10

Mean Scores and Standard Deviations for Technology Tools Competence based on Degree Programs

Item	M[a]	SD
Degree Programs Group		
Workforce Development	29.84	9.42
General Studies	26.52	8.40
Health-Related	34.65	9.41

[a] n = 99

Table 11

Perceived Competence to Use Technology Tools

Item	M[a, b]	SD
Technology Tool		
Internet	3.49	.721
Cloud	2.59	1.100
Web Conferencing	2.72	1.134
Video Sharing	3.01	1.059
Facebook	3.29	.952
Twitter	2.69	1.268
Instagram	2.87	1.235
Vine	2.43	1.255
Social Media Management	1.93	1.139
Customer Relationship Management	1.98	1.052
Email Marketing	1.84	1.080
Organization	2.37	1.127

[a] n = 150 [b] 5 = Very Important, 4 = Important, 3 = Neither Important or Unimportant, 2 = Unimportant, 1 = Very Unimportant

Results showed statistically significant differences for students' competency to utilize technology tools based on their degree programs [$F(2, 96) = 5.435$, $p = .006$]. Follow-up tests were conducted to evaluate pairwise differences. There was a significant difference in competency to utilize software technology between students enrolled in General Studies degree programs and students enrolled in Health-Related degree programs ($p = .004$). The mean score for students within the General Studies degree programs group was 26.52 compared to the mean score of 34.65 for students within the Health-Related degree programs group, with standard deviations of 1.58 and 1.90 respectively.

Research Question 5: To what extent do students enrolled in one or more career and technical education courses at a community college in a Southeastern state perceive that they need further development of skills concerning (a) software technology, (b) hardware technology, and (c) technology tools based on degree program?

The fifth research question was analyzed using higher-way analysis of variance (ANOVA) tests to ascertain the difference in students' development of skills concerning: (a) hardware technology, (b) software technology, and (c) technology tools based on degree program.

Need for Further Development of Software Skills

Participants responded to the software technology items on a four-point Likert-type scale ranging from zero to three with three indicating expert competence, two indicating moderate competence, one indicating basic competence, and zero indicating no competence. The software technology items that respondents determined if they needed further development in were: Microsoft Word, Microsoft PowerPoint, Microsoft Excel, Microsoft Access, Microsoft Outlook, Video Editing Software, Photography Editing Software, Web Page Design Software, Antivirus Software, and Accounting Software. A total score for each participant could range from 10 to 40 for the 10 items related to hardware, with the highest possible mean value of 20. Due to missing responses, n = 98 for need for further development of software skills. The mean scores and standard deviations for differences in students' need for further development of skills concerning software technology items are shown in Table 12 and the mean scores and standard deviations for software are shown in Table 13.

Table 12

Mean Scores and Standard Deviations for Need for Further Development of Software Technology Skills based on Degree Programs

Item	M[a]	SD
Degree Programs Group		
Workforce Development	13.95	3.44
General Studies	12.55	3.29
Health-Related	13.61	3.97

[a] n = 98

Table 13

Mean Scores and Standard Deviations for Need for Further Development of Software Technology Skills

Item	M[a]	SD
Software		
Microsoft Word	1.67	.471
Microsoft PowerPoint	1.63	.486
Microsoft Excel	1.38	.487
Microsoft Access	1.28	.452
Microsoft Outlook	1.46	.500
Video Editing Software	1.24	.428
Photography Editing Software	1.28	.451
Web Page Design Software	1.20	.400
Antivirus Software	1.37	.483
Accounting Software	1.21	.405

[a] n = 147

Results showed no statistically significant differences for students' need for further development of skills concerning software technology based on their degree programs group [$F(2, 95) = 1.529$, $p = .222$].

Need for Further Development of Hardware Skills

Participants responded to the hardware technology items on a four-point Likert-type scale ranging from zero to three with three indicating expert competence, two indicating moderate competence, one indicating basic competence, and zero indicating no competence. The hardware technology items that respondents determined if they needed further development in were: Table, Digital Camera, Digital Video Camera, Webcam, Laptop, Scanner, Headphone, Microphone, USB/Flash Drive, Router, Smartphone, Smartboard, GoPro Camera, 3D Printer, and Smart Watch. A total score for each participant could range from 15 to 60 for the 15 items related to hardware, with the highest possible mean value of 30. Due to missing responses, n = 97 for need for further development of hardware skills. The mean scores and standard deviations for differences in students' need for further development of skills concerning hardware technology items are shown in Table 14 and the mean scores and standard deviations for hardware are shown in Table 15.

Table 14

Mean Scores and Standard Deviations for Need for Further Development of Hardware Technology Skills based on Degree Programs

Item	M[a]	SD
Degree Programs Group		
Workforce Development	24.12	4.36
General Studies	21.42	5.24
Health-Related	23.23	5.91

[a] n = 97

Table 15

Mean Scores and Standard Deviations for Need for Further Development of Hardware Technology Skills

Item	M[a]	SD
Hardware		
Tablet	1.68	.469
Digital Camera	1.74	.441
Digital Video Camera	1.66	.477
Webcam	1.60	.492
Laptop	1.73	.445
Scanner	1.57	.497
Headphone	1.80	.400
Microphone	1.72	.451
USB/Flash Drive	1.74	.437
Router	1.45	.499
Smartphone	1.68	.469
Smartboard	1.38	.486
GoPro Camera	1.28	.451
3D Printer	1.23	.422
Smart Watch	1.32	.469

[a] n = 147

Results showed no statistically significant differences for students' need for further development of skills concerning hardware technology based on their degree programs group [$F(2, 94) = 2.663$, $p = .075$].

Need for Further Development of Technology Tools Skills

Participants responded to the hardware technology items on a four-point Likert-type scale ranging from zero to three with three indicating expert competence, two indicating moderate competence, one indicating basic competence, and zero indicating no competence. The hardware

technology items that respondents determined if they needed further development in were: Internet, Cloud, Web Conferencing, Video Sharing, Facebook, Twitter, Instagram, Vine, Social Media Management, Customer Relationship Management, Email Marketing, and Organization. A total score for each participant could range from 12 to 48 for the 12 items related to technology tools, with the highest possible mean value of 24. Due to missing responses, n = 97 for need for further development of technology tools skills. The mean scores and standard deviations for differences in students' need for further development of skills concerning technology tools are shown in Table 16 and the mean scores and standard deviations for technology tools are shown in Table 17.

Table 16

Mean Scores and Standard Deviations for Need for Further Development of Technology Tools Skills based on Degree Programs

Item	M[a]	SD
Degree Programs Group		
Workforce Development	3.21	.81
General Studies	2.94	.75
Health-Related	3.18	.85

[a] n = 97

Table 17

Mean Scores and Standard Deviations for Need for Further Development of Technology Tools Skills

Item	M[a]	SD
Technology Tool		
Internet	1.75	.433
Cloud	1.45	.499
Web Conferencing	1.54	.500
Video Sharing	1.63	.484
Facebook	1.77	.421
Twitter	1.66	.476
Instagram	1.67	.472
Vine	1.52	.501
Social Media Management	1.27	.445
Customer Relationship Management	1.28	.452
Email Marketing	1.27	.448
Organization	1.40	.492

[a] n = 147

Results showed no statistically significant differences for students' need for further development of skills concerning technology tools based on their degree programs group [$F(2, 94) = 1.194$, $p = .308$].

Research Question 6: To what extent do students enrolled in one or more career and technical education courses at a community college in a Southeastern state perceive that they can complete basic computer tasks without assistance?

The fifth question in section three of the Values and Skills of Community College Students (VSCCS) instrument was used to address the sixth research question. The basic computer skills that respondents identified the most as being able to complete without assistance were: Save a Microsoft Word document as a different file type (94.0%), Utilize spell check to edit documents (91.9%), Create headers and footers in Microsoft Word (91.9%), Create a folder on the desktop (89.2%), Copy a copy/paste using shortcuts (88.4%), Create a table in Microsoft Word (87.3%), Empty the Recycle Bin (87.1%), and Open a link in a new window in a web browser (87.0%). The mean scores and standard deviations for ability to complete basic computer tasks are shown in Table 18. Frequency results are shown in Tables 19-24.

Table 18

Mean Scores and Standard Deviations for Ability to Complete Basic Computer Tasks

Item	M[a]	SD
Task		
Utilize Spell Check to edit documents	1.08	.273
Create a table	1.13	.334
Create Headers and Footers	1.08	.274
Complete a Mail Merge	1.34	.474
Save a Word document as a different file type	1.06	.239
Create Formulas	1.32	.468
Edit Formulas	1.35	.478
Create Macros	1.54	.500
Create a presentation	1.16	.365
Add transitions to a presentation	1.22	.419
Add a video to a presentation	1.27	.443
Add a link to a presentation	1.22	.413
Create an email	1.17	.376
Add an attachment	1.20	.400
Create a signature	1.36	.482
Create a folder	1.29	.456
Add contacts	1.28	.450
Open a link in a new window	1.13	.338
Clear browser cache	1.19	.394
Edit URLs to navigate	1.25	.434
Create bookmarks/favorites	1.18	.382
Utilize Boolean operators	1.63	.484
Manually run a virus scan	1.33	.472
Run a disk defragmentation	1.46	.500
Empty the Recycle Bin	1.13	.337
Complete a copy/paste using shortcuts	1.12	.321

(Table continues)

(Table 18 continued)

Mean Scores and Standard Deviations for Ability to Complete Basic Computer Tasks

Item	M[a, b]	SD
Task		
Complete a cut/paste using shortcuts	1.14	.343
Verify physical connectivity to a network	1.23	.424
Determine IP address	1.35	.479
Create a folder on the desktop	1.11	.312
Zip/Compress a folder/file	1.32	.467
Unzip/Decompress a folder/file	1.33	.473
Change a folder/file name	1.10	.305

[a] n = 150

Table 19

Ability to Complete Basic Computer Tasks in Microsoft Word Without Assistance

Item	f[a]	%
Utilize Spell Check to edit documents		
No	12	8.1
Yes	137	91.9
Create a table		
No	19	12.7
Yes	131	87.3
Create headers and Footers		
No	12	8.1
Yes	136	91.9
Complete a Mail Merge		
No	49	33.6
Yes	97	66.4
Save a Word document as a different file type		
No	9	6.0
Yes	140	94.0

[a] n = 225

Table 20

Ability to Complete Basic Computer Tasks in Microsoft Excel Without Assistance

Item	f[a]	%
Create Formulas		
No	48	32.0
Yes	102	68.0
Edit Formulas		
No	52	34.7
Yes	98	65.3
Create Macros		
No	80	54.1
Yes	68	45.9

[a] n = 225

Table 21

Ability to Complete Basic Computer Tasks in Microsoft PowerPoint Without Assistance

Item	f[a]	%
Create a presentation		
No	23	15.6
Yes	124	84.4
Add transitions to a presentation		
No	33	22.4
Yes	114	77.6
Add a video to a presentation		
No	39	26.5
Yes	109	73.5
Add a link to a presentation		
No	32	21.6
Yes	116	78.4

[a] n = 225

Table 22

Ability to Complete Basic Computer Tasks in Microsoft Outlook Without Assistance

Item	f[a]	%
Create an email		
No	25	16.9
Yes	123	83.1
Add an attachment		
No	29	19.9
Yes	117	80.1
Create a signature		
No	53	36.1
Yes	94	63.9
Create a folder		
No	43	29.1
Yes	105	70.9
Add contacts		
No	41	27.9
Yes	106	72.1

[a] n = 225

Table 23

Ability to Complete Basic Computer Tasks using a Web Browser Without Assistance

Item	f[a]	%
Open a link in a new window		
No	19	13.0
Yes	127	87.0
Clear browser cache		
No	28	19.0
Yes	119	81.0
Edit URLs to navigate		
No	37	25.0
Yes	111	75.0
Create bookmarks/favorites		
No	26	17.6
Yes	122	82.4
Utilize Boolean operators		
No	96	63.3
Yes	54	36.7

[a] n = 225

Table 24

Ability to Complete Basic Computer Tasks Without Assistance

Item	f[a]	%
Manually run a virus scan		
No	49	33.1
Yes	99	66.9
Run a disk defragmentation		
No	67	46.2
Yes	78	53.8
Empty the Recycle Bin		
No	19	12.9
Yes	128	87.7
Complete a copy/paste using shortcuts		
No	17	11.6
Yes	130	88.4
Complete a cut/paste using shortcuts		
No	20	13.5
Yes	128	86.5
Verify physical connectivity to a network		
No	34	23.3
Yes	112	76.7
Determine IP address		
No	52	35.1
Yes	96	64.9
Create a folder on the desktop		
No	16	10.8
Yes	132	89.2
Zip/Compress a folder/file		
No	47	31.8
Yes	101	68.2

(Table continues)

(Table 24 continued)

Ability to Complete Basic Computer Tasks Without Assistance

Item	f[a]	%
Unzip/Decompress a folder/file		
No	49	33.3
Yes	98	66.7
Change a folder/file name		
No	15	10.3
Yes	131	89.7

[a] n = 225

Research Question 7: To what extent is there a correlation between overall work values and technology skills of students enrolled in one or more career and technical education courses at a community college in a Southeastern state?

To assess whether or not there was a relationship between overall work values and technology skills of students enrolled in one or more CTE courses at a community college in a Southeastern state, question one from section two was compared to questions one, two, and three of section three of the Values and Skills of Community College Students (VSCCS) instrument. The Pearson product-moment correlation coefficient was utilized to determine if there was a relationship between overall works values and technology skills. The results are shown in Table 25.

Table 25

Correlation Between Overall Work Values and Technology Skills

Technology Skills	Pearson Product-Moment Correlation Coefficients
Hardware Technology Skills	.010
Software Technology Skills	- .076
Technology Skills	.004

**. Correlation is significant at the 0.01 level (2-tailed)

The Pearson product-moment correlation coefficient was computed to assess the relationship between overall work values and technology skills of students. There was no correlation between overall work values and skills concerning: hardware technology ($r = .010$, $n = 150$, $p = .903$), software technology ($r = -.076$, $n = 150$, $p = .352$), or technology tools ($r = .004$, $n = 150$, $p = .960$). This indicates that there is no relationship between overall work values and technology skills.

V. Summary, Conclusion, and Recommendations

Introduction

Employment upon completion of a degree or certificate is the goal of career and technical education (CTE) programs at the community college level. CTE programs must ensure graduates possess the values and skills employers seek. In order to ensure students possess these desired skills and values, programs' curricula must be continually scrutinized to align student learning outcomes with employer demands. Without such scrutiny, there is no guarantee that CTE graduates are prepared to enter the workforce in a high-paying, in-demand career. A research survey instrument was developed to assess the overall work values and technology skills of students enrolled in one or more CTE courses at a community college in a Southeastern state. Analyses were conducted to determine the overall work values, the technology skills, perceived competency level to complete basic computer tasks, and the correlation between work values and technology skills of the population.

In the previous chapter, data collected from students enrolled in one or more CTE courses at a community college in a Southeastern state utilizing the researcher-developed Values and Skills of Community College Students (VSCCS) survey instrument were presented and analyzed. This chapter includes a discussion of the findings, conclusions, and recommendations.

Summary of Findings

The majority of students enrolled in one or more CTE courses at a community college in a Southeastern state that participated in the study were female (71.3%). The highest reported ages were between 20 to 29 years of age (42.9%). The largest percent of respondents identified themselves as Caucasian (52.9%). General Studies was the highest reported degree program (29.5%).

Higher-way analysis of variance (ANOVA) was used to ascertain the difference in overall work values based students' degree program. There were no statistically significant differences in overall work values of students overall work values based on their degree program [$F(2, 107) = .053$, $p = .949$].

Respondents were asked to rank work values from most important (1) to least important (14). High salary/income (24.7%) and opportunity to advance quickly (22.2%) were the two highest ranked work values. The opportunity to make friends (.6%) and opportunity to socialize with others (.6%) were the least important work values.

Higher-way analysis of variance (ANOVA) was used to ascertain the difference in students' competency to use: (a) hardware technology, (b) software technology, and (c) technology tools based on degree programs group.

Hardware Technology

There were no statistically significant differences in competency to utilize hardware technology based on their degree programs group [$F(2, 96) = 2.384$, $p = .098$].

Software Technology

Results showed statistically significant differences in competency to utilize software technology based on students' degree programs group [$F(2, 95) = 3.554$, $p = .032$]. Pairwise

comparisons revealed statistically significant differences between students within the General Studies degree programs group and students within the Health-Related degree programs group (p = .028). Students within the Health-Related degree programs group were more competent in utilizing software than General Studies degree programs (M = 25.86).

Technology Tools

In addition, there were statistically significant differences in competency to utilize technology tools for students degree programs [F(2, 96) = 5.435, p = .006]. Pairwise comparisons revealed statistically significant differences between students within the General Studies degree programs group and students within the Health-Related degree programs group (p = .004). Students within the Health-Related degree programs group reported higher competency levels than those students within the General Studies degree programs group (M = 34.65).

Higher-way Analysis of Variance (ANOVA) was used to ascertain students' need for further development of skills concerning: (a) software technology, (b) hardware technology, and (c) technology tools based on their degree programs.

Need for Further Development of Software Skills

There were no statistically significant differences for their perceived need for further development of skills concerning software technology based on their degree programs [F(2, 95) = 1.529, p = .222].

Need for Further Development of Hardware Skills

In addition, there were no statistically significant differences in perceived need for further development of skills concerning hardware technology tools [F(2, 94) = 2.663, p = .075].

Need for Further Development of Technology Tools Skills

Furthermore, there were no statistically significant differences in perceived need for further development of skills concerning technology tools for students based on their degree programs [$F(2, 94) = 1.194$, $p = .308$].

Students enrolled in a CTE program at a community college in a Southeastern state were asked to state their perceived ability to complete basic computer tasks without assistance. Most respondents reported that they could save a Microsoft Word document as a different file type (94.0%), could utilize spell check to edit documents (91.9%), and could create headers and footers in Microsoft Word (91.9%). Respondents identified creating macros and utilizing Boolean operators as tasks that could not easily complete with 45.9% and 36.7% of students, respectively, stating that they could complete the tasks without assistance.

To assess whether or not there is a relationship between overall work values and technology skills of students, the Pearson product-moment correlation coefficient was utilized. There was no correlation between overall work values and skills concerning: hardware technology ($r = .010$, $n = 150$, $p = .903$), software technology ($r = -.076$, $n = 150$, $p = .352$), or technology tools ($r = .004$, $n = 150$, $p = .960$) indicating that there is no relationship between overall work values and technology skills.

Conclusions

The following conclusions were based on the findings of the study.

1. Students enrolled in one or more CTE courses at a community college in a Southeastern state have no statistical differences in their overall work values across different degree programs. The leading work values were high salary/income and opportunity to advance quickly meaning students value extrinsic work values above intrinsic, social, and altruistic work values.
2. The competency level to utilize technology tools is impacted by degree programs. When analyzing information, the data revealed that the competency level concerning software technology and technology tools is impacted by students' degree programs (Workforce Development, General Studies, Health-Related), but competency level for hardware technology is not impacted by degree programs.
3. Students do not perceive a need for further development of their skills concerning: software technology, hardware technology, or technology tools. However, students' ability to complete computer tasks without assistance varied from 94% (Save a Word document as a different file type) to 36.7% (Utilize Boolean operators) meaning there are varied technology skills amongst students enrolled in CTE programs.
4. There is no relationship between overall work values and the technology skills of students enrolled in one or more CTE courses at a community college in a Southeastern state; thus, we cannot determine a student's technology skills by identifying his or her overall work values.

Recommendations

Based on the conclusions, the following recommendations are made:

1. Consideration should be given to work values in course development and course-implementation (on-campus, hybrid, online). Since community college students have identified external work values as the most valued work value type, utilizing external motivators could lead to increased completers, or graduates.
2. Further research should be conducted to determine if Health-Related CTE degree programs at other community colleges have higher competency levels concerning skills related to software technology and technology tools.
3. As students' ability to complete basic computer tasks varied widely, consideration should be given to developing a lower-level technology course that teaches basic computer skills that are not currently covered in the curriculum, but are necessary for employment in high-demand, high-salary fields.
4. Consideration should be given to have all newly enrolled students take a technology examination, such as the industry-accepted Internet and Computing Core Certification (IC3), to determine students' skill level concerning technology as students' ability to complete basic computer tasks varied widely. With this knowledge, instructors and personnel can better advise students on course selection.
5. A follow-up study should be conducted in two years to determine if work values have changed amongst the population and if progress has been made concerning the acquisition of skills concerning: software technology, hardware technology, and technology tools.
6. This study should be repeated at community college in other states.

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Appendices

Appendix A

Auburn Institutional Review Board Approval Letter

Office of Research Compliance
115 Ramsay Hall, basement
Auburn University, AL 36849

AUBURN UNIVERSITY

Telephone: 334-844-5966
Fax: 334-844-4391
IRBadmin@auburn.edu
IRBsubmit@auburn.edu

November 19, 2015

MEMORANDUM TO: Mr. Chadwick Springer
Department of Curriculum and Teaching

PROTOCOL TITLE: "Work Values and Technology Skills of Students Enrolled in Career and Technical Education at a Community College"

IRB FILE NO.: 15-282 EX 1507

APPROVAL DATE: July 6, 2015
EXPIRATION DATE: July 7, 2018

Your protocol was approved as "Exempt" by the IRB under 45 CFR 46.101(b)(2)**:**

> Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless:
> (i) information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and
> (ii) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation.

Note the following:

1. CONSENTS AND/OR INFORMATION LETTERS: Only use documents that have been approved by the IRB with an approval stamp or approval information added.
2. RECORDS: Keep this and all protocol approval documents in your files. Please reference the complete protocol number in any correspondence.
3. MODIFICATIONS: You must request approval of any changes to your protocol before implementation. Some changes may affect the assigned review category.
4. RENEWAL: Your protocol will expire in three (3) years. Submit a renewal a month before expiration. If your protocol expires and is administratively closed, you will have to submit a new protocol.
5. CLOSING THE PROTOCOL: When your study is complete, please notify the Office of Research Compliance, Human Subjects.

If you have any questions concerning this Board action, please contact the Office of Research Compliance.

Bernie R. Olin, Phar.D.
Chair of the Institutional Review Board #2
for the Use of Human Subjects in Research

cc: Leanne Skinner

Appendix B

Researcher-Developed Survey Instrument

Values and Skills of Community College Students

Default Question Block

Dear Chattahoochee Valley Community College Student:

You are invited to participate in a research study designed to investigate the work values and technology skills of community college students enrolled in Career and Technical Education programs. This study is being conducted by Chadwick Springer, a doctoral candidate, under the supervision of Dr. Leane Skinner, an Associate Professor in the Business Education Program at Auburn University. You were selected as a participant because you are listed as an enrolled student in the Summer 2015 semester at Chattahoochee Valley Community College.

Your participation is completely voluntary. If you decide to participate in this research study, you will be asked to complete and submit an electronic survey. Your total time commitment will be approximately 10 minutes.

Your input, as a current community college student, is vital to the success of this research. Any data obtained in connection with this study will remain anonymous. We will protect your privacy and the data you provide by not collecting IP addresses and e-mail addresses when the survey is submitted.

If you change your mind about participating, you can withdraw at any time by closing your browser window. Once you have submitted anonymous data, it cannot be withdrawn since it will be unidentifiable. Your decision about whether or not to participate or to stop participating will not jeopardize your future relations with Chattahoochee Valley Community College or Auburn University. Information collected through your participation may be used as partial fulfillment of the requirements for the Doctor of Philosophy Degree and future presentations and publications.

If you have any questions about this study, please contact Chadwick Springer at (334) 844-3810 (sprinca@auburn.edu) or Dr. Leane Skinner (334) 844-3800 (skinnal@auburn.edu).

If you have questions about your rights as a research participant, you may contact the Auburn University Office of Human Subjects Research or the Institutional Review Board by phone (334) 844-5966 or email at IRBAdmin@auburn.edu.

Please click the >> button to begin the survey.

Are you at least 19 years of age?

- Yes
- No

Section I: Demographics

What is your gender?

- Male
- Female

What is your age?

- Less than 20 years of age
- 20-29 years of age
- 30-39 years of age
- 40-49 years of age
- 50-59 years of age
- 60-69 years of age
- 70+ years of age

What is your ethnicity?

- African-American
- Asian
- Caucasian (White)
- Hispanic/Latino
- Native American
- Other

What is your current degree program?

- Applied Technology: Air Conditioning and Refrigeration
- Applied Technology: Automotive Manufacturing
- Applied Technology: Industrial Maintenance
- Applied Technology: Sustainable Construction/Renewable Energy
- Business
- Business: Accounting
- Business: Banking and Finance
- Business: Management and Supervision
- Business: Small Business Management
- Business and Office Technology: Administrative Technology
- Business and Office Technology: Legal Administrative Technology
- Business and Office Technology: Medical Administrative Technology
- Computer Information Systems: CISCO Networking
- Computer Information Systems: Information Technology
- Criminal Justice
- Fire Science
- Homeland Security
- Medical Assisting
- Nursing (ADN)
- Nursing (Mobility)
- Visual Communications: Multimedia Graphic Design
- Visual Communications: Simulation and Modeling
- Other

How many semesters have you completed of your current degree program?

- Less than 1 semester
- 1 semester
- 2 semesters
- 3 semesters
- 4 semesters
- 5 or more semesters

Section II: Work Values

(2a) Please evaluate each statement/prompt below and indicate the level of importance when considering a job/career.

	Very Unimportant	Unimportant	Neither Important or Unimportant	Important	Very Important	Not Applicable
1. Opportunity to advance quickly						
2. High salary/income						
3. High social status						
4. Respect from others						
5. Ability to utilize skills and abilities						
6. Ability to be creative						
7. Interesting job						
8. Opportunity to learn new skills						
9. Opportunity to work with friends						
10. Opportunity to make friends						
11. Opportunity to socialize with others						
12. Ability to work alone						
13. Opportunity to help others						
14. Ability to benefit society as a whole						

(2b) Please rank the following in order from most important (1) to least important (14) related to the most desirable criteria when you seek a job/career.

Move each prompt up or down in level of importance by selecting the prompt with your mouse and dragging it up or down.

- Opportunity to advance quickly
- High salary/income
- High social status
- Respect from others
- Ability to utilize skills and abilities
- Ability to be creative
- Interesting job
- Opportunity to learn new skills
- Opportunity to work with friends

- Opportunity to make friends
- Opportunity to socialize with others
- Ability to work alone
- Opportunity to help others
- Ability to benefit society as a whole

Section III: Technology Skills

(3a) Please indicate the level of competence to which you are prepared to utilize software on a job.

4. Expert Competence: you have an in-depth knowledge and skill to fully utilize the software at a job.
3. Moderate Competence: you have reasonable knowledge and skill to utilize this software at a job.
2. Basic Competence: you have minimal skill and knowledge to utilize this software at a job.
1. No Competence: you do not have knowledge or skill to utilize this software at a job.

	1 - No Competence	2 - Basic Competence	3 - Moderate Competence	4 - Expert Competence
Microsoft Word	○	○	○	○
Microsoft PowerPoint	○	○	○	○
Microsoft Excel	○	○	○	○
Microsoft Access	○	○	○	○
Microsoft Outlook	○	○	○	○
Video Editing Software	○	○	○	○
Photography Editing Software	○	○	○	○
Web Page Design Software	○	○	○	○
Antivirus Software	○	○	○	○
Accounting Software (ex: QuickBooks)	○	○	○	○

(3b) Please indicate the level of competence to which you are prepared to utilize hardware on a job.

4. Expert Competence: you have an in-depth knowledge and skill to fully utilize the hardware at a job.
3. Moderate Competence: you have reasonable knowledge and skill to utilize most of this hardware at a job.
2. Basic Competence: you have minimal skill and knowledge to utilize this hardware at a job.
1. No Competence: you do not have knowledge or skill to utilize this hardware at a job.

	1 - No Competence	2 - Basic Competence	3 - Moderate Competence	4 - Expert Competence
Tablet (ex: iPad)				
Digital Camera				
Digital Video Camera				
Webcam				
Laptop				
Scanner				
Headphone				
Microphone				
USB/Flash Drive				
Router				
Smartphone				
Smartboard				
GoPro Camera				
3D Printer				
Smart Watch (ex: Apple Watch)				

(3c) Please indicate the level of competence to which you are prepared to utilize technology tools on a job.

4. Expert Competence: you have an in-depth knowledge and skill to fully utilize the technology tool at a job.
3. Moderate Competence: you have reasonable knowledge and skill to utilize most of this technology tool at a job.
2. Basic Competence: you have minimal skill and knowledge to utilize this technology tool at a job.
1. No Competence: you do not have knowledge or skill to utilize this technology tool at a job.

	1 - No Competence	2 - Basic Competence	3 - Moderate Competence	4 - Expert Competence
Internet	○	○	○	○
Cloud (ex: DropBox)	○	○	○	○
Web Conferencing (ex: Skype)	○	○	○	○
Video Sharing (ex: YouTube)	○	○	○	○
Facebook	○	○	○	○
Twitter	○	○	○	○
Instagram	○	○	○	○
Vine	○	○	○	○
Social Media Management (ex: Hootsuite)	○	○	○	○
Customer Relationship Management (ex: Salesforce)	○	○	○	○
Email Marketing (ex: MailChimp)	○	○	○	○
Organization (ex: Google Drive)	○	○	○	○

(3d) Please indicate which software tools, hardware tools, and technology tools that you believe you need further training in to develop the necessary technical skills for employment.

	Need Further Development	Do Not Need Further Development
Microsoft Word	○	○
Microsoft PowerPoint	○	○
Microsoft Excel	○	○
Microsoft Access	○	○
Microsoft Outlook	○	○
Video Editing Software	○	○
Photography Editing Software	○	○
Web Page Design Software	○	○
Antivirus Software	○	○
Accounting Software (ex: QuickBooks)	○	○
Tablet (ex: iPad)	○	○
Digital Camera	○	○
Digital Video Camera	○	○
Webcam	○	○
Laptop	○	○
Scanner	○	○
Headphone	○	○
Microphone	○	○
USB/Flash Drive	○	○
Router	○	○
Smartphone	○	○
Smartboard	○	○
GoPro Camera	○	○
3D Printer	○	○
Smart Watch (ex: Apple Watch)	○	○
Internet	○	○
Cloud (ex: Dropbox)	○	○
Web Conferencing (ex: Skype)	○	○
Video Sharing (ex: YouTube)	○	○
Facebook	○	○
Twitter	○	○
Instagram	○	○
Vine	○	○
Social Media Management (ex: Hootsuite)	○	○
Customer Relationship Management (ex: Salesforce)	○	○
Email Marketing (ex: MailChimp)	○	○
Organization (ex: Google Drive)	○	○

(3e) Please indicate which of the following skills you can complete without assistance.

	Yes	No
1. Utilize Spell Check to edit documents	○	○
2. Create a table in Microsoft Word	○	○
3. Create Headers and Footers in Microsoft Word	○	○
4. Complete a Mail Merge in Microsoft Word	○	○
5. Save a Microsoft Word document as a different file type	○	○
6. Create formulas in Microsoft Excel	○	○
7. Edit formulas in Microsoft Excel	○	○
8. Create Macros in Microsoft Excel	○	○
9. Create a PowerPoint presentation	○	○
10. Add transitions to a PowerPoint presentation	○	○
11. Add videos to a PowerPoint presentation	○	○
12. Add a link in a PowerPoint presentation	○	○
13. Create an email in Microsoft Outlook	○	○
14. Add an attachment to an email in Microsoft Outlook	○	○
15. Create a signature for an email in Microsoft Outlook	○	○
16. Create a folder in Microsoft Outlook	○	○
17. Add contacts in Microsoft Outlook	○	○
18. Open a link in a new window in a web browser	○	○
19. Clear browser cache in a web browser	○	○
20. Edit URLs to navigate in a web browser	○	○
21. Create bookmarks/favorites in a web browser	○	○
22. Utilize Boolean operators in a search engine	○	○
23. Manually run a virus scan of a computer	○	○
24. Run a disk defragmentation	○	○
25. Empty the Recycle Bin	○	○
26. Complete a copy/paste using shortcuts	○	○
27. Complete a cut/paste using		

Section IV: Other

What factors contributed to your decision to enroll at CVCC?

Appendix C

Information Letter

AUBURN
UNIVERSITY

COLLEGE OF EDUCATION

CURRICULUM AND TEACHING

INFORMATION SHEET
FOR
Work Values and Technology Skills of Students Enrolled in Career and Technical Education at a Community College

Dear Chattahoochee Valley Community College Student:

You are invited to participate in a research study designed to investigate the work values and technology skills of community college students enrolled in Career and Technical Education programs. This study is being conducted by Chadwick Springer, a doctoral candidate, under the supervision of Dr. Leane Skinner, an Associate Professor in the Business Education Program at Auburn University. You were selected as a participant because you are listed as an enrolled student in the Summer 2015 semester at Chattahoochee Valley Community College.

Your participation is completely voluntary. If you decide to participate in this research study, you will be asked to complete and submit an electronic survey. Your total time commitment will be approximately 10 minutes. There is no compensation or costs to the participants of this research study.

Your input, as a current community college student, is vital to the success of this research. Any data obtained in connection with this study will remain anonymous. We will protect your privacy and the data you provide by not collecting IP addresses and e-mail addresses when the survey is submitted.

If you change your mind about participating, you can withdraw at any time by closing your browser window. Once you have submitted anonymous data, it cannot be withdrawn since it will be unidentifiable. Your decision about whether or not to participate or to stop participating will not jeopardize your future relations with Chattahoochee Valley Community College or Auburn University. Information collected through your participation may be used as partial fulfillment of the requirements for the Doctor of Philosophy Degree and future presentations and publications.

If you have any questions about this study, please contact Chadwick Springer at (334) 844-3810 (springcs@auburn.edu) or Dr. Leane Skinner (334) 844 3823 (skinnal@auburn.edu).

If you have questions about your rights as a research participant, you may contact the Auburn University Office of Human Subjects Research or the Institutional Review Board by phone (334) 844-5966 or email at IRBAdmin@auburn.edu.

HAVING READ THE INFORMATION ABOVE, YOU MUST DECIDE IF YOU WANT TO PARTICIPATE IN THIS RESEARCH PROJECT. IF YOU DECIDE TO PARTICIPATE, PLEASE CLICK ON THE LINK BELOW. YOU MAY PRINT A COPY OF THIS EMAIL TO KEEP.

7/10/2015

Chadwick Springer
Doctoral Candidate
Principal Investigator

The Auburn University Institutional Review Board has approved this document for use from July 6, 2015 to July 5, 2018. Protocol #15-282 EX 1507.

LINK TO SURVEY

Auburn University Institutional Review Board has approved this document for use from 7/6/15 to 7/5/18 Protocol # 15-282 EX 1507

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