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The University of Southern Mississippi

AN ASSESSMENT COMPARING COMMUNITY COLLEGE STUDENTS'  
COMPUTER SELF-EFFICACY AND TASK BASED COMPUTER KNOWLEDGE

by

Amy Nicholson Stewart

Abstract of a Dissertation  
Submitted to the Graduate School  
at The University of Southern Mississippi  
in Partial Fulfillment of the Requirements  
for the Degree of Doctor of Philosophy

May 2016

## ABSTRACT

### AN ASSESSMENT COMPARING COMMUNITY COLLEGE STUDENTS' COMPUTER SELF-EFFICACY AND TASK BASED COMPUTER KNOWLEDGE

by Amy Nicholson Stewart

May 2016

This quantitative research study explored the relationship between students' perceived computer self-efficacy and actual knowledge of computer related skills in computer hardware/technology, windows, Word, Excel, and PowerPoint and whether gender, race, and education level affected the research findings.

The participants in this study were students enrolled in an introductory computer concepts course at a community college located in the southeastern region of the United States. The computer course was a requirement for all students to receive an Associate of Arts and Associate of Applied Science degree. Data was collected in traditional face-to-face class sections and consisted of a pre- and post-computer self-efficacy survey and a pre- and post-test skills assessment on three different campuses. The scores in the area of computer hardware/technology, windows, Word, Excel, and Power Point were compared to determine whether a relationship exists between Computer self-efficacy and actual knowledge in the area of computers. In addition to a series of a one-way Analysis of Variance, a Repeated Measures Analysis of Variance, and a Bivariate Correlation, the study also utilized descriptive analysis of demographic data and responses to a questionnaire regarding participants' prior technology experience and usage.

Findings of the study indicated that students' computer self-efficacy was much greater than actual knowledge in the area of computers. Findings of the study did show

no significant difference in computer self-efficacy concerning gender, race, and education. No significant differences were found in the education level and skill level of the participants at the beginning of the CSC 1113 course. A significant difference was found in skill level among the different races at the beginning of the CSC 1113 course with the exception of Power Point. The study did show that there was no significant difference in skill level for gender except in the area of technology. The study found a positive correlation in the numbers of computer courses students completed in high school to computer self-efficacy at the beginning of the semester in the course CSC 1113.

At the completion of the course CSC 1113, *Computer Concepts*, computer self-efficacy scores were significantly higher. Findings also showed a significant increase in the skill levels, Windows, Word, Excel, and Power Point at the completion of the CSC 1113 course. The study had not shown significant difference in hardware/technology skills at the completion of the CSC 1113 course.

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2016

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COMPUTER SELF-EFFICACY AND TASK BASED COMPUTER KNOWLEDGE

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Amy Nicholson Stewart

A Dissertation  
Submitted to the Graduate School  
and the Department of Curriculum, Instruction, and Special Education  
at The University of Southern Mississippi  
in Partial Fulfillment of the Requirements  
for the Degree of Doctor of Philosophy

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## DEDICATION

This dissertation is dedicated to all the educators out there, who touch lives every day without even knowing it.



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## LIST OF ABBREVIATIONS

ANOVA	Analysis of Variance
CSC	Computer Science
CSE	Computer Self-efficacy
$F$	Fisher's F ratio
$M$	Mean
$p$	Probability associated with the occurrence under the null hypothesis of a value as extreme as or more extreme than the observed value
$r$	Pearson product-moment correlation
SAM	STUDENT ASSESSMENT MODULE
$sd$	Standard Deviation
SE	Self-efficacy
SPSS	Analytical software product original standing for Statistical Package for the Social Sciences
<	Less Than
>	Greater Than
=	Equal to

## CHAPTER I

### INTRODUCTION

Society has the perception that students of the Net Generation have the technological aptitude to be successful in college classrooms and in the corporate world. However, many college students enter college as freshmen without the technological skills expected of college instructors to be successful in the classroom. College instructors and administrators are discontinuing introductory computer classes from college course requirements because of this misperception. Colleges cannot simply assume that students have these skills because they have grown up with technology, and there needs to be a way to determine which students have the technology skills and those who do not. Properly assessing these skills will place students into courses where they can acquire the technological skills needed to be successful in the classroom and in their careers.

The Millennials, Net Generation, and Generation Y, often dubbed as “the computer wizard” generation (Shannon, 2007), are descriptors that currently define the teens or young adults born after 1981 (Sanchez, 2003). These children of past decades have grown up since the emergence of the World Wide Web and a myriad of other types of digital technologies that have been introduced (i.e., cell phones, text messaging, video games, and instant messaging) (Considine, Horton, & Moorman, 2009). This group referred to as those born between 1981 and 2000. Within this millennial generation, a new generation has emerged as Generation C or Generation Connected. Generation C refers to those born after 1990; they are aptly considered truly digital natives (Williams, Crittenden, Keo, & McCarty, 2012).

Societal and university faculty's perceptions favor the general belief that the Millennial Generation (MG) already possesses these skills (Shannon, 2007; VanLengen, 2007). However, despite their constant exposure to all things digital, the 'connected' generation often struggles and encounters difficulty with their academic work (Shannon, 2007). This generation has access to more information than any other generation in history, but the availability of the vast amounts of information has created a complex environment for students to navigate within (Considine et al., 2009). College faculty and administration assume that many of the current college freshmen have some basic computer proficiency skills based upon prior computer experiences. Many college and university educators also have the perception that students are more knowledgeable and competent in the area of computers (Grant, Malloy, & Murphy, 2009). Many students themselves also share this perception. According to Grant, Malloy, and Murphy (2009), students who are required to take an introductory computer applications course at the college level often feel that the course is not necessary because they have previously passed an assessment in K-12 or had a computer course in high school (9<sup>th</sup>-12<sup>th</sup> grade).

As cited by Grant and colleagues (2009), in a study reported in the *Journal of Information Technology*, the researchers explored college students' computer self-efficacy across the United States and the actual scores on a computer assessment in a foundational computer course. During the first week of class, pre-tests were administered in a computer concepts class. The scores were dramatically different from how students rated their computer skill levels. On a survey prior to taking the pre-test assessment, 75% of the students rated their skills as high in the word processing application software, Microsoft Word. However, less than 50% of the students were able to answer questions

correctly pertaining to the advanced tasks. When students were asked to rate their computer self-efficacy in the spreadsheet application software, Microsoft Excel, they rated their ability levels much lower. Additionally, when post-tests were administered in the last week of the semester and computer self-efficacy was re-evaluated, the number of questions answered correctly substantially increased (Grant et al., 2009).

Lazim, Wan, Noor, and Noor (2011) reported similar findings in a study reported in the *Journal of Information Systems: New Paradigms* describing college freshman students' perceptions towards their computer-related skills. The school was a public university at the East Coast of Peninsular Malaysia and used an instrument to explore 851 freshman students' computer self-efficacy. The school also used an assessment tool to evaluate students' skills in the following six computer related areas: word processing, spreadsheet, databases, multimedia, desktop publishing, and Internet. Three indicators, 'not at all,' 'somewhat competent,' and 'very competent,' were used to rank the ability levels. The highest percentage where students ranked themselves as 'very competent' was in the area of Internet Skills with the lowest being in databases. The reflections of the scores in these two areas were consistent with actual skills competency ratings.

Fredrickson, Freund, Amer, Baldauf, and Parsons (personal communication, March 7, 2013) in a question and answer session at the Cengage Course Technology Conference, shared similar views about the college students of today and the introductory computer applications course as authors of computer textbooks from across the United States. All members of the panel, with the exception of one, are not only authors but also teach introductory computer concepts at a community college or university.



One of the instructors serving on the panel in the question and answer session was Steven Freund, a Cengage author and teacher at University of Central Florida (UCF). At UCF, over 4,000 students annually take the Introduction to Computers course. When Freund was asked about the challenges he faced in teaching the Introduction to Computers course, he replied, “Many students are not motivated and engaged” (Fredrickson, Freund, Amer, Baldauf, & Parsons, personal communication, March 7, 2013). Another obstacle he mentioned is the varying levels of computer skills among the students. He added that many of the students he encountered in an online course were not equipped with the technology skills to be successful in an online course (Fredrickson, Freund, Amer, Baldauf, & Parsons, personal communication, March 7, 2013).

Lisa Fredrickson, another panel participant at the Cengage Course Technology Conference, advocated using a pre-test and post-test assessment of students to survey varying technology skills in the course. When she administered her final exam to students the first week of class to assess their skills, only 3% of her students were able to pass the test. Beverly Amar from Arizona State University indicated that when Arizona State offered the College Level Examination Program (CLEP) only one out of 100 students were able to successfully CLEP out of the course. Ken Baldauf of Florida State University commensurate by mentioning that those on the college level have been expecting the computer literacy course to be pushed down to the high school level, which has not yet happened (Fredrickson, Freund, Amer, Baldauf, & Parsons (personal communication, March 7, 2013).

Twenty years ago, emphasis in an introductory computer course was placed on teaching programming in BASIC; however, today the lab activities cover application

software such as word processing, spreadsheets, database, presentation, and use of the Internet. Many of these courses have reduced time spent on teaching word processing because students should have been taught and utilized word processing programs already in high school. Universities are also incorporating more Web 2.0 technologies such as blogs, wikis, and other types of social networking into instruction (VanLengen, 2007). Developing expertise in a few technologies understandably becomes much more different from being able to understand, use, and assess technology.

Computer literacy courses, once a staple, have begun a downward decline and may soon be discontinued as a graduation requirement for undergraduate students (Ritz, 2011). Schools that have not eliminated the course from the required course curriculum do require students to demonstrate computer or technology competency by taking a test similar to a CLEP in lieu of taking the course (VanLengen, 2007).

There are many reasons why these requirements have changed in colleges and universities today. One reason is an emerging change in colleges requiring a computer competency course due to reduction of program hours required to graduate. This change stems from a 2002 decision by the Southern Association of Colleges and Schools to reduce the minimum number of hours required for students to receive a baccalaureate degree from 128 hours to 120 hours. The decision was made based on the cost and the length of time to complete a baccalaureate degree. Since this change, many colleges and universities have reduced their required number of credit hours to receive a baccalaureate degree to meet this 120-hour rule (Shannon, 2007). Additionally, many programs have sought external accreditation from professional boards, and this has placed additional stress on the curriculum. Due to the eight-hour reduction in credit hours needed for an

undergraduate degree, courses have been cut from the degree requirements. One such course often on the chopping block has been the introductory computer course requirement (Hulick & Valentine, 2008). As a result of the reduction in the number of hours that students have to take to receive a degree, courses once required as part of the academic core, such as computer concepts, have been cut all across the country (Hulick & Valentine, 2008; Shannon, 2007).

Societal perceptions make it easy to assume that the “Net Generation” has the necessary computer skills to be successful in college. These perceptions contribute to the decision to remove basic computer courses from the curriculum. Research indicates time again that Internet usage and “Facebooking” do not give students the tech-saviness they need to think cognitively (Hulick & Valentine, 2008). Students also have to be able to apply these skills to future courses. Some students may have the computer skills necessary to be able to bypass a computer literacy course and the ability to be successful in future classes; however, the vast majority do not retain these basic skills and abilities (Grant et al., 2009; Hulick & Valentine, 2008; Ratliff, 2009; Ritz, 2011). There needs to be a formal approach to assess students to determine whether or not they are computer literate. If students do not have these basic skill sets, they should be required to partake in a basic computer course as part of the required curriculum for their graduation program.

#### Statement of the Problem

Research has shown that basic computer skills, as well as advanced computer skills, are more in demand today for corporate America (Hulick & Valentine, 2008). Countries such as Brazil, Russia, India, China, and Korea (BRICK) are placing emphasis on developing computer skills and computer professions among their young people to remain competitive in a global economy. In contrast, many schools across the United

States are discontinuing the computer elective from high school graduation requirements, assuming that students who have grown up with technology already possess the necessary computer skills (Ritz, 2011).

Students entering college today are viewed as highly technology competent because of the many gadgets college students own today. Many of these students can be seen carrying iPods, iPads, smart phones, laptops, and other digital devices. Students' ability to spend countless hours on the Web and "Facebooking" can be cited as support of their being computer competent; nonetheless, they do not know how to use the devices for classroom assignment purposes. Social media skills alone do not demonstrate technology knowledge or literacy (Hulick & Valentine, 2008). Students seem to be comfortable with the basic skills of using Internet, e-mail, and word processing, whereas research shows that these students rate their computer skills very high; however, when students are asked to rate their computer self-efficacy for school related tasks, these rates drop significantly (Grant et al., 2009).

Research demonstrates that even though these undergraduates may possess a high level of computer self-efficacy, this belief does not always translate into their computer abilities or skill levels. Computer courses are still necessary to help undergraduates obtain basic computer skills. These courses are in jeopardy of being removed from college graduation requirements while their need is more in demand than ever before (Hulick & Valentine, 2008; Shannon, 2007).

A procedural or curricular change is needed by the college to determine students who possess these critical skills and those that do not. Students entering college without these skills would have a course in place to give them the instruction needed; students

already possessing the skills could waive the course altogether. Relying on students' computer self-efficacy is not adequate to evaluate the actual technology skills of students. College advisors cannot continue to use computer self-efficacy for placement of students in computer courses. An assessment is needed to ensure that students are placed in the computer courses that match their skill level or if they show proficiency allow provisions in the advising process for students' to bypass the computer course requirement entirely..

### Purpose of the Study

The purpose of this study is to determine whether there is a relationship between community college students' computer self-efficacy and their actual computer skills. Computer/technology skills, as defined by this study, encompass an introduction to technology (i.e., mobile devices, Internet, networking, and computer hardware), the Windows operating system, and word processing (Microsoft Word), spreadsheet (Microsoft Excel), and presentation skills (Power Point). When referring to computer/technology skills in this study the researcher is referring to computers (laptops, desktops, and tablets) and/or mobile devices. Further, this study examines whether students' computer skills in these areas are sufficient to meet the objectives set by the introductory computer concepts course.

Independent variables considered in this research study were the demographic factors of gender, ethnicity, and education (i.e., traditional college students, General Equivalency Diploma (G.E.D.) students, and non-traditional students). Another independent variable examined in the study was testing time. Testing time consisted of two levels: pre-course and post-course scores. The dependent variables were the mean scores of the computer self-efficacy instruments, and the five mean scores from each of

the different skills the study surveyed (i.e. Technology/Hardware skills, Windows, Word Processing, Spreadsheet, and Presentation skills). This information was used to determine whether students' computer skills were sufficient to meet the objectives as outlined in the computer concepts course.

For the purpose of this study, computer skills are defined by an understanding of computer hardware/technology, Windows, Word Processing, Spreadsheets, and Presentation skills. Course Content in CSC 1113 is outlined based on Misty Vermaat's (2016) textbook *Microsoft Office 2013 Introductory Enhanced Edition* Shelly Cashman Series. The course begins with students learning about computer hardware skills such as the **I**nput **P**rocessing **O**utput and **S**torage (IPOS) Cycle. Students are educated on the different components of the computer and the primary purpose of each part. Different types of technology are taught such as iPads, laptops, Internet skills, smart phones, social networking, and networking devices. Also, operating systems using Windows are taught focusing on navigation throughout the software, how to open a program application, and file/directory management.

The course also introduces the application software word processing, spreadsheets, and presentation software. Instructors teaching word processing use the application Microsoft Word. In Microsoft Word, students create a flyer using clipart, fonts, and borders. Students also learn how to format a research paper utilizing footnotes, headers/footers, and the reference feature. The unit on spreadsheet applications uses the software Microsoft Excel and students are taught the SUM, AVERAGE, MAX, and MIN functions along with how to create a chart in a worksheet. The last unit covered in the semester is presentation software using PowerPoint where students have learned how to

create a multi-level slide, importing graphics, different ways to view a presentation, and incorporating sound and videos

In Figure 1, a concept map is provided showing all of the content covered in the course CSC 1113, as outlined in the required textbook for the course, titled, Microsoft Office 2013 Enhanced Edition, Shelly Cashman Series (Vermaat, 2016).

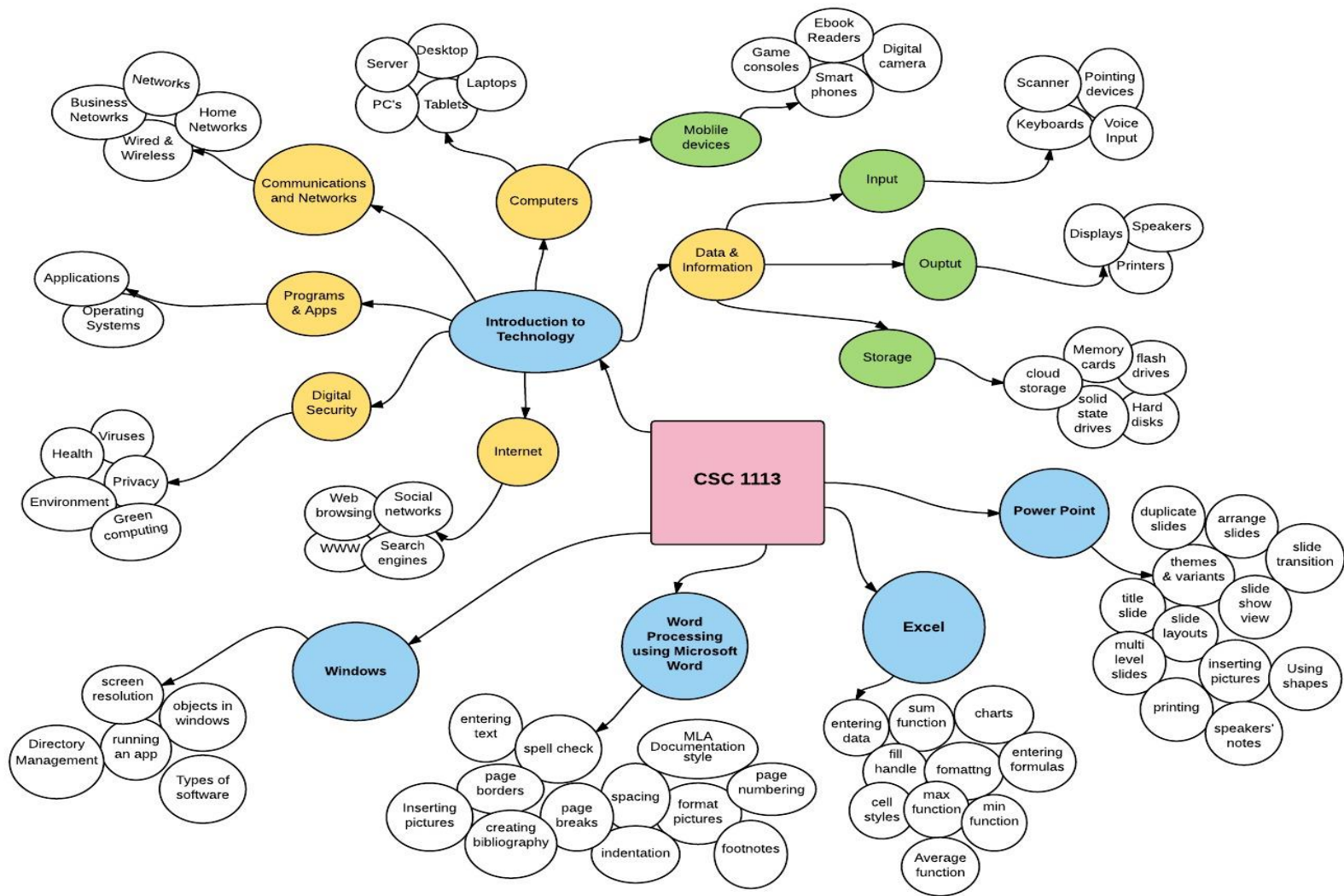


Figure 1. CSC 1113 Concept Map



## Theoretical Foundation

The two theoretical foundations that guide this study are Bandura's Theory of Self-Efficacy (SE) and Bandura's Theory of Computer Self-Efficacy (CSE). In a world where youth have grown up "connected," educators often assume that students entering college classrooms today possess the technology savviness to be successful in college and in their future jobs. The actual situation is that these students do not possess the type of technology skills needed for academic purposes. However, many students consider themselves computer literate even if they do not possess the skills needed to be successful in college and in the workplace (Ratliff, 2009).

Even with technology being a part of daily lives, some students are more proficient while others find technology to be a major challenge. The theory of self-efficacy explains these differences in behavior (McCoy, 2010). As defined by Bandura, self-efficacy is a belief in one's abilities to organize and follow-through with a course of action to attain a goal (Bandura, 1995, 1997, 1999). Research consistently shows that a positive correlation of high levels of self-efficacy results in positive self-concept, higher levels of learning, and persistence in an activity. Additionally, lower levels of self-efficacy have been found to result in lower self-concept, lower performance, and unwillingness to try certain tasks (McCoy, 2010).

The rapid growth of technology in an information-based society is placing enormous pressure on individuals to be self-directed in their pursuit of knowledge. A good education should not only teach the three R's—reading writing, and arithmetic—but also instill physiological traits and motivation to continue to learn after school is complete. One of the major outcomes of a student receiving a formal education should be

the desire to become a lifelong learner. Self-efficacy is an intrinsic belief that one has the ability to learn new material and educate one's self throughout a lifetime (Bandura, 1995, 1997, 1999). According to Bandura (1997), "computer self-efficacy is based on the well-researched concept of self-efficacy—the belief one has the capability to perform a specific computer related task" (as cited by Karsten & Roth, 1998a, p. 61). CSE is intellectualized as multilevel in that an individual can judge his or her ability level both on an application-specific and on a general level. While the application-specific level is a judgment of one's ability to use specific software types such as spreadsheets, databases, etc., the general CSE level is an individual's belief in the ability to master skills across different areas of computers (Brown, 2008; Hong, Chiu, Shih, & Lin, 2012).

Murphy's CSE instrument is the oldest instrument referenced for recording computer self-efficacy. Other skills besides software and hardware are considered important such as Internet and computer attitudes along with computer anxiety. Computer anxiety refers to a fear one may have in causing potential damage to a computer while using it or looking dumb. Attitudes associated with the Internet are only recently being studied while evaluating computer self-efficacy; positive feelings toward using computers for Internet-related tasks contributed positively to overall computer self-efficacy. Computer attitudes can be associated with enjoyment, anxiety, and confidence using the machine to generate an individual's computer self-efficacy score (Brown, 2008; Hong et al., 2012). This current study measures two variables: computer knowledge/skills and computer self-efficacy.

## Research Questions

The research questions that guided the study are:

R1a: Is there a difference in demographics (gender, race, education) regarding computer self-efficacy prior to taking the CSC 1113 course?

R1b: Is there a difference in demographics (gender, race, education) in skills assessment scores prior to taking the CSC 1113 course?

R2 = Does the number of computer courses taken in high school correlate to the computer self-efficacy prior to taking the CSC 1113 course?

R3a: Do pre- and post-CSE scores differ as a result of taking the CSC 1113 course?

R3b: Do pre- and post-skills assessment test scores differ as a result of taking the CSC 1113 course?

## Justification

This study has the potential benefit of incorporating change in the academic core curriculum that includes a way for students to bypass the computer concepts core requirement by having a test-out option. Proposed economics of a test-out procedure allow students to bypass the computer course requirement or take a more advanced course. A test-out procedure can also ensure that students who do not have the computer skills needed to be successful in undergraduate coursework could obtain those skills by taking the course CSC 1113. This policy change allows advisors to more effectively advise students and ensure proper placement of students based on their skills. The college has been relying on students' opinions of their computer skills for placement in computer courses; this study shows that such an action is not a reliable indicator for placement.

Furthermore, students who have the necessary computer skills may be able to take other courses, thus bypassing CSC 1113, and accelerating their progress towards a degree or transfer to a university.

Kathleen M. Morris (2010) from the University of Alabama conducted a similar research study. However, the Computer self-efficacy instrument used in this study was a self-generated instrument that did not show proven reliabilities.

#### Researcher Assumptions

The identifiable research assumptions that guided this study are:

1. Participants answered the questions to the best of their ability and their responses were honest and based on their perceptions of skills and abilities.
2. The study assumes that, based on the demographics for the college, there will be a proportional mix of participants based on gender, race, and education level.

#### Delimitations of Study

The researcher had no control over the time and day the student participants were in the class or the length of class time. Students enrolled in a Monday, Wednesday, Friday section were 50-minute sessions whereas the Tuesday/Thursday student participants had 25 minutes longer in class time. A supporting assumption is that the participants required the same amount of time to complete the survey packet.

Community college students make up a very diverse population. The researcher had no control over students' background prior to enrolling in CSC 1113. Some participants may have been recent high school graduates while others may have been in the workforce prior to enrolling in the course. In addition, some students may have been enrolled in high schools from a rural, low-income area where others may have been from

a more affluent school district, which would have allowed some students to have been exposed to current software and computer technology.

Instructors that offered their classes to participate were on a volunteer basis and the researcher had no control over the number of sections that participated. Therefore, this may have affected the number of student surveys that were completed out of the overall classroom population.

While there is a set course syllabi and core competencies in CSC 1113, there are no restrictions to prevent an instructor from adding additional material and assignments to an individual class. There is no structured outline of the course time frame for each unit covered within each class. The researcher had no control over individual teaching styles within the various class sections. Therefore, the assumption is that the survey instrument covered the basic course objectives as outlined by the course syllabi allowing all students to have the basic knowledge required to answer the survey packet.

Because not all students completed the course, all participants may not have been able to complete both the pre- and post-course instruments, Various reasons may have caused this to happen such as students withdrawing from the course, cutting out due to attendance, and students may have been absent the day the survey was administered.

The study assumes that participants answered everything within the survey packet honestly and to the best of their ability. Assumptions were made that all research participants could read, understand, and respond intelligently to the questions in the research instrument.

## Definition of Terms

This study examined two variables, computer knowledge/skills and computer self-efficacy, based upon demographic factors. To clarify terms used throughout the study, the following definitions are provided.

*College Level Examination Program (CLEP).* A test given to a student to demonstrate mastery in a subject, thus allowing him or her to bypass a course.

*Community College.* Community college often refers to post-secondary institution that offers two-year institutions of higher education. The college usually has access to public funding (state and federal) and is not primarily dependent upon student tuition (Maloney, 2003). These types of institutions offer two different degrees and one certificate. The Associate of Arts degree is reflective of completion of the freshman and sophomore years of college and is parallel to the four-year university with academics matching to ensure coursework transfers. The Associate of Applied Science is the second degree offered by the community college and is awarded once a student completes a two-year intensive career-technical curriculum. Lastly, a Career and Technical Education Certificate is presented to the student after completion of an intensive one-year training program that is often taught in a hands-on laboratory-type setting (“Bulletin of Northwest Mississippi Community College,” 2014).

*Computer hardware/technology.* As outlined by this study includes hardware, peripherals, and technology devices.

*Computer Literacy, Digital Literacy, or Technology Literacy.* Merriam Webster Dictionary (“Literacy,” 2014) defines literacy as knowledge that relates to a specific

subject. International Technology Education Association (ITEA) has defined technology literacy as the ability to use, manage, understand, and assess technology (Ritz, 2011).

*Digital Natives.* Often used to describe Generation C—those born after 1990. Generation C is the first generation that has grown up in a digital world; its members do not remember a time when society is not connected to the World Wide Web (Considine, et al., 2009; Williams et al., 2012; Worley, 2011).

*Introductory Computer Course.* A computer concepts course generally taught during a student's first year of college. The course is designed to provide foundation knowledge to students and teach them the computer/technology and application/software skills needed for future college courses.

*Millennial Generation. Synonymous with the Net Generation, Generation Y, or the Computer Wizards.* This group is defined to be those people who were born after 1981 (Sanchez, 2003; Shannon, 2007).

### Summary

A growing problem in colleges is the societal perception that because students have grown up in a connected society, they, therefore, have the foundational computer skills required to obtain an undergraduate degree and succeed in the workplace. Preparing college students to become competitive in the technology marketplace is more important than ever before. Administrators cannot assume that students are technologically literate because they have grown up in a connected society. Students should be screened as freshmen to measure the degree of computer literacy they possess; and if the skills are not at a level of mastery, then colleges need to require them to take a class to gain these skills.

The purpose of the study was to investigate whether or not there is a correlation between students' computer self-efficacy and their actual computer skills. Research was obtained by administering a Computer self-efficacy survey to students the first week of class along with a test assessing computer skills that were taught over the course of the semester. The same instruments were administered at the semester's conclusion. The study examined several constructs to see if they made a difference such as the number of high school computer courses a student had completed, gender, ethnicity, and education level.

The outcome of the study has the potential benefit of incorporating a change in the academic core curriculum to include a way for students to bypass the computer concepts core requirement by having a test-out option. This policy change will allow advisors to effectively advise students and will ensure proper placement of students based on their skills. The research obtained from this study may show if this course is a value added course in the academic core curriculum for the college.

This research study is organized into five chapters. Chapter I includes background information of the study and the problem being investigated. Also included in Chapter I is the purpose of the study, the theoretical foundation/rationale for the study, the research questions, justification, the limitations of the study, and research assumptions. Chapter II includes a review of the literature and provides background information for the study. Chapter III explains the methods used to conduct the study. Also included in Chapter III is the design of the study, along with descriptions of the research setting, selection of participants, instruments of data collection, and process of data collection. Chapter IV



presents the findings of the study and the descriptive data and analysis. Chapter V offers a summary of the findings, conclusions, and recommendations for future research.

## CHAPTER II

### LITERATURE REVIEW

#### Introduction

This chapter describes the literature support for the study. Findings collected from relevant research studies are described to demonstrate why this study is important in the field of computer literacy. The review of literature consists of eight parts. These components of the literature review describe how technology is changing society, the value of computer/technological skills, the net generation and their computing experiences, United States Community Colleges, computer skills of college students, self-efficacy theory, computer self-efficacy theory, and assessing computer self-efficacy.

College students today are referred to as the “Net Generation” or “Millennials” (Considine et al., 2009); these terms describe the generation born between 1981 and 2000 (Gibbs, 2008; Sanchez, 2003; Shannon, 2007; Worley, 2011). Despite growing up in this digital age, many students lack necessary computer knowledge and skills to use a computer to complete classroom assignments. Increased usage of computers and technology do not translate into having sufficient computer skills (Heflin, 2015; Nelson, Courier, & Joseph, 2011; Uraski, 2009; Worley, 2011). Self-efficacy is people’s perceptions and beliefs in their capabilities to perform a particular task (Bandura 1995, 1997, 1999), and computer self-efficacy is referred to as an individual’s self-evaluation or personal assessment in one’s ability to use a computer for a variety of tasks (Brown, 2008; Celik & Yesilyurt, 2013; Hauser, Paul, Bradley, & Jeffrey, 2012; Hsiao, Tu, & Chung, 2012; Karsten & Roth, 1998b). A community college’s primary goal is to prepare

students to become successful for transfer to the university or into the world of work. As such, ensuring that students have the required technology skills is a critical element of preparedness.

### How Technology is Changing Society

As societal demands become more about being mobile, there has been a major shift in the focus of the workplace. Businesses and organizations are moving toward a more mobile environment, and the trend is becoming more about individuals working on the go and being connected rather than functioning within the traditional office boundaries (Sena, 2013). According to *Business Insider* (Edwards, 2015), since iPhone's launch in 2007, a majority of Internet traffic is now on smartphones, not desktop machines. The demand for tablets and smartphones is driving this shift in the workplace. *Forbes* (High, 2014) reports the trend in 2015 is going to be more of an Internet of things propelled by user-oriented computing. 3D printing will continue to decrease in cost over the next three years. This will propel innovation in prototypes for industry, consumer applications, and in the medical field.

#### *Smartphones and Tablets*

According to Pew Research Center, 68% of adults in America now have a smartphone, which is nearly double the amount since Pew Research Center began measuring smartphone ownership in mid-2011 (Anderson, 2015). At that point 35% of adults had smartphones (Anderson, 2015). *TechCrunch* (Lunden, 2015) reports that smartphone users by 2020 will make up 70% of the world population. Forecasts also predict that by 2020, 80% of mobile data traffic will be from smartphones (Lunden, 2015).

Tablets have an even faster adoption rate than smartphones. Nearly half of all Americans own a tablet with 45% reporting tablet ownership. That is up 41% since 2010 when Pew Research Center first began measuring tablet ownership (Anderson, 2015). According to *eMarketer*, tablets surpassed the one billion mark in ownership representing 15% of the world population in 2015 (“Tablet users to surpass,” 2015). Tablets are quickly becoming a popular choice among consumers and are beginning to replace both laptops and desktop computers in the workforce. Tablets have become more powerful and functional for consumer usage. Many of the same functions carried out on tablets can be completed on personal computers; however, tablets are lighter and slimmer (Mantell, 2012). Industry likes how tablets are opening up communication channels in the workplace; they are allowing workers to communicate, capture, examine, and transmit information simultaneously. The price of tablets is also appealing to industry because they are not as expensive as traditional computer systems have been in the past (Burney, 2013).

While the demand for tablets in the workplace has gained momentum, tablets have yet to command domination over the traditional computer or personal computer in the workplace. Despite the fact that the processing capabilities of tablets continue to improve, businesses still use personal computers such as laptops and desktops. One reason for this is that personal computers last five to seven years in a business environment. Another reason is that a traditional computer is better to keep up with the everyday productivity demands and high volume multi-tasking. While tablets provide a variety of accessories such as docking stations and keyboards, they are not quite there yet in terms of sustainability (Mantell, 2012).

Tablets should not be dismissed as they may gain advantage over personal computers in the future if current trends of smaller digital devices continue to climb. Tablets are changing the way people use computers. As tablets engulf the consumer market, they are stimulating innovation in app development and cloud-based platforms; some may go so far as to say that tablets will replace personal computers in the workforce (Mantell, 2012). In the educational arena, tablets are quickly changing the way students and instructors utilize textbook content. Projections for 2017, expect digital textbooks to account for half of the textbook market (Rivero, 2013).

### *E-books*

Textbooks are becoming more interactive with embedded media versus the traditional text-based content. This is providing a much more immersive learning experience for readers. The learning experience can be much more engaging for the student. Rather than simply reading about a historical event, students can watch a historical reenactment to include a blend of text and media (Bajarin, 2013; Rivero, 2013).

Cengage Learning Ebooks provide cost effective means for students to access course materials and digital content. Students are also able to rent an Etextbook or Ebook, which can save them up to 65% off the cost of traditional textbooks. Students are able to go online to take interactive quizzes, utilize flashcard resources, and work on problems in a completely collaborative environment using these Ebooks (Rivero, 2013).

### *Apps and Cloud Technology*

Apple App Store and Google Play are great resources for applications (apps). In the field of manufacturing and industry, professionals find the customization feature of apps appealing. If manufacturers find an app on the market that is similar to their needs

but does not meet all of their expectations, companies may opt to hire a developer to customize an app based on individual needs (Burney, 2013).

Many business professionals have shifted away from the larger and more traditional computers in the workplace because of the demand for and use of apps and cloud-based platforms (Mantell, 2013). According to a report published by Frost and Sullivan in which 300+ businesses were surveyed in North America, 73% of respondents stated that at least one mobile app was used by their employees on hand-held devices. In those companies that responded, 71% said that by late 2014 they plan to add one or more applications to their employees' hand-held devices (Sterling, 2013).

Most of what allows businesses to telework or conference with customers remotely is the "cloud." The cloud is not only transforming technology, but also transforming businesses. Employees want to be able to access customer data anytime, anywhere, and from any device to conduct their jobs. While using the approach of access anytime anywhere through mobile devices, organizations must also consider security. Maintaining a secure network infrastructure does allow the flexibility but also brings the added responsibilities of network security and customer privacy, both of which can be challenging. Cloud computing can provide a cost-effective way to provide these information technology (IT) resources and implement strategic change (Sena, 2013).

### *Connectivity*

Another essential element in this cloud environment is connectivity for all of these on-the-go devices. 3G/4G cellular technologies and Wi-Fi give users the ability to stay connected in this fast-paced world. iPass, the world's largest commercial Wi-Fi network, released a report in September 2013 from a study they conducted; iPass found

that traveling business professionals rate Wi-Fi almost as important as having a comfortable bed. Seventy-three percent of their survey participants rated the experience of using hotel Wi-Fi as “very important” or “important” to them. In addition, 81% of the surveyed participants reported having experienced inadequate service with hotel Wi-Fi in the past 12 months; most reported after a bad experience with Wi-Fi, they would not return to the hotel next time they traveled (iPass, Inc., 2013).

Mobile workers now believe Wi-Fi connectivity is a basic need like food, water, and shelter. Traveling business professionals indicated good quality Wi-Fi was more important than a restaurant or gym facilities, even if they had to pay for the Wi-Fi services. Costs aside, workers want their hotel Wi-Fi to provide the speed and bandwidth they need to conduct their business. Wi-Fi is so essential to travelers’ needs that WI-FI is rated as the second-most essential factor, only after a comfortable bed. Inflight Wi-Fi is another growing trend to meet the demands of the mobile worker. Seventy-nine percent of the participants in the iPass report stated that they would spend as much as \$10 for inflight Wi-Fi services (iPass, Inc., 2013).

Technology is changing rapidly as society transitions into more of an on-the-go society. A crucial element of the on-the-go mentality is staying connected. Tech companies every day are developing ways to turn everyday items into portable computers, from glasses, to watches, and fitness trackers. Mobility is at the heart of these innovations (Tsukayama, 2013). Professionals are no longer working at a desk; they may work as they commute, watch their child play soccer, or stay in for the evening. Technology that allows them to do these tasks while working is the cloud capabilities of tablets, apps, Wi-Fi, and smart phones. These technological advances are also changing the way society

educates students as well. Textbooks are no longer limited to the traditional textbooks; they may be interactive and found on a tablet. Students can click on links for additional content to supplement reading assignments, or they may remediate weaker skills by using an app for learning Algebra. More important than ever is for students to be able to navigate through this infiltration of technology as society advances and becomes more dependent on technology. College administrators and faculty members cannot simply assume that college freshmen have the technological skills to navigate through this plethora of devices and technology that have infused society and educational systems. This dissertation shows how these computer/technological skills are necessary and valuable for students to be successful in the workforce and society.

#### Value of Computer/Technology Skills

Computers are no longer new to the education arena or the workplace. However, many still do not have valuable skills needed in the college classroom and those skills highly sought after in the workplace. Computer/Technology skills are important for all learners in every country (Ritz, 2011). Society views college graduates as those who have grown up with the World Wide Web and have the technological aptitude to be successful workers in a connected society (Burgess, Price, & Caverly, 2012; Considine et al., 2009; Gibbs, 2008; Hulick & Valentine, 2008; Ratliff, 2009). National Council of Instructors of English (NCTE) defined 21<sup>st</sup> Century literacies (2013) as a collection of cultural and communicative practices shared among members of particular groups stating that as society and technology change, so will literacy. NCTE went on to say that because technology has increased in intensity and complexity, it is important to develop a proficiency and fluency with the tools of technology. One can conclude that it can be



overwhelming when trying to define the following: Computer Literacy, Technology Literacy, Computer Competency, and Computer Proficiency.

Computer skills, knowledge basis, and individual expertise areas all comprise a valued and prized commodity in corporate America. These traits are all highly sought after by potential employers (Hulick & Valentine, 2008; Heflin, 2015). Grant et al. (2009) emphasized the importance of teaching technology literacy and 21<sup>st</sup> century skills when they stated, “If the U.S. is to remain competitive in an ever-increasing global economy, then it becomes increasingly important to hire workers who are adequately prepared to utilize current and future information technology” (p. 142). Moody, Stewart, and Bolt-Lee, surveyed 1500 corporate recruiters and found the most valued skills to obtain for career paths were (a) communication (oral and written), (b) computer literacy, (c) interpersonal/social, (d) critical thinking/leadership (tied), and (e) teamwork. Only communication skills were more highly valued than computing skills by corporate America (as cited in Hulick & Valentine, 2008 p. 2).

Governments at all levels (local, state, or federal) have potential to become weakened by not adopting a stronger interest in these literacy rates. Ignoring this area, they create potential education barriers, and they are unilaterally and are continually holding people back from advancement. For instance, Lazim et al. (2011) noted, “Studies indicate that while a large majority of students indicated that they own computers and have access to the Internet, their skills that directly relate to their courses at the institute of higher education were rather disappointing” (p. 41). Science studies, engineering studies, and computer science studies are all precursors for a country’s advancement. Competition exists among BRICK countries (i.e. Brazil, Russia, India,

China, and South Korea). There continues to be a fight for immigration roadblocks from their own countries, and improvements continue for their stance in the global economy (Ritz, 2011).

BRICK countries examine and re-examine areas of their educational systems to look at barriers and enhance curriculum such as through STEM (Science, Technology, Engineering, and Mathematics). STEM, a word often used on United States' campuses and in secondary schools, conveys the areas educators target for improvement in technology advancements. Science technology, engineering, and mathematics education along with computer/technology skills are interwoven concepts, and many instructors have begun to focus curriculum on incorporating these valued technological skills (Ritz, 2011).

Computer/technology skills are important for all learners. It is important to develop proficiency and fluency with the tools of technology. These traits are all highly sought after. It becomes increasingly important to hire workers who are adequately prepared to utilize current and future information technology.

#### Net Generation and Computing Experiences

There are terms to describe groups of young people all over the world who are entering colleges and universities (Jones, Ruslan, Simon, & Graham 2010). Three of the most common terms are Net Generation, (Sanchez, 2003; Worley, 2011), Digital Natives, (Burgess, Price, & Caverly, 2012; Considine, Horton, & Moorman, 2009; Gibbs, 2008; Ratliff, 2009; Worley, 2011), and Millennials (Jones, Ruslan, Simon, & Graham 2010). Net Generation students include the 20 to 30 year olds used to having information at their fingertips (Sanchez, 2003; Worley, 2011). This generation is the largest generation since

the baby boomer generation, and this group makes up more than 80 million people (Worley, 2011). These students have grown up immersed in technology, and they have access to more information than any other generation before them (Considine et al., 2009; Worley, 2011). These digital natives have grown up during a time of rapidly changing technological culture (Worley, 2011). They are fluent in how to gain information instantaneously using a variety of electronic devices. These students are also used to having access to their cell phones and computers. Many obtain their news solely from the Internet. This generation is also the most diverse of any other generation in terms of economically, politically, ethnically, racially, and culturally (Sanchez, 2003; Worley, 2011). The Net Generation also studies, writes, and interacts differently than any other generation before them. This generation reads blogs where previous generations read newspapers. This generation often meets people online before they ever meet someone face-to-face. Many are more likely to send a text message rather than pick up a telephone (Palfrey & Gasser, 2008).

Students of this generation are often described as multitaskers (Bennett, Maton, & Kervin, 2008; Jones et al., 2010; Palfrey & Gasser, 2008). Many are likely sitting in class Googling, playing games, and IM-ing (Instant Messaging) all at the same time (Jones et al., 2010). Many digital natives think of Google, Instant Messaging, and texting as verbs rather than applications (Jones et al., 2010). Students of this generation prefer to learn by doing rather than by reading; they prefer to discover rather than be told (Jones et al., 2010). Immersion in this digital culture is said to have shaped how this generation learns in the classroom when compared to previous generations. Students of the Net Generation are active experimental learners, proficient in multitasking, and dependent on

communication technologies for interacting with others and accessing information (Bennett et al., 2008). They expect to be engaged by their environment with hands-on, sensory-rich activities (either online or physical) with opportunities to provide input (Jones et al., 2010).

Digital natives are constantly connected. Most aspects of their lives—social interactions, friendships, and civic activities—are mediated through digital technologies, and they have never known anything different (Palfrey & Gasser, 2008). They have friends both in real space and in virtual worlds. Many times, as they sleep, they are making connections; they wake up to encounter connections with people whom they may not have ever encountered in an offline world (Palfrey & Gasser, 2008). A 2008 survey found that 82% of university students in the United States were registered with more than one social networking site, with Facebook and MySpace being the most common. The survey also reported that these students spent approximately five hours per week on the above-mentioned sites, often logging into their accounts on a daily basis (Jones et al., 2010).

Through social networks, these natives share Instant Messaging content, photos, and videos, and they collaborate creatively. This generation is probably one of the most creative of any other generation. They consider information encountered online malleable to suit their own needs and often do so without considering they may be breaking the law. This may mean editing a video, downloading music, or downloading a movie, while not considering copyright rules and regulations (Palfrey & Gasser, 2008).

What separates this group of students from others is that they are the first generation immersed with Information Communication Technology (ICT) throughout

their entire lives (Bennett et al., 2008; Burgess 2012; Considine et al., 2009; Gibbs, 2008; Jones et al., 2010). With the pervasiveness of ICT, Millennials have access to more information than any other generation before them. Additionally, the extensive use of Information Communication Technology by this generation has created a false perception regarding this generation's level of computer knowledge (Considine et al., 2009; Heflin, 2015; Ratliff, 2009).

Growing up immersed in a digital culture does not translate into viable computer skills. While most young people are comfortable in the digital world, few of them have the knowledge and skills of computer applications deemed suitable for higher education or for the workforce (Considine et al., 2009; Gibbs 2008; Heflin, 2015; Tanner, 2011). The perception of educators has mistakenly become the following: students who have grown up using the Internet are already adept and that these same students should be able to use a computer or demonstrate computer literacy upon entering college (Messineo & DeOllos, 2005; Ratliff, 2009). People are confusing computer use with computer knowledge and computer skills. While today's young people are comfortable with the digital world, many of them are actually no more prepared than previous generations in regards to knowledge and skills surrounding computer applications on a level suited and usable for higher education or for the workforce (Gibbs, 2008; Messineo & DeOllos, 2005).

The Net Generation is the largest generation since the baby boomers and is probably one of the most creative of any other generation. Few of this generation have the knowledge and skills of computer applications deemed necessary for higher

education. This dissertation aims to prove these assertions and confirm the importance of computer technology skills.

### United States Community Colleges

Because this study took place at a community college, it is important to understand the make-up of the community college environment. Women make up the largest demographic of community college students along with non-traditional students. Over half of this country's community college students receive some type of financial aid. Minorities make up nearly a third of the community college students in this country. Demographic research has consistently shown that students in these categories have the lowest computer self-efficacy levels.

Community colleges are unique in the United States' higher educational system because they offer federal and state subsidized two-year post-secondary degrees and vocational certificates to a wide range of students. Degrees offered by community colleges offer tuition drastically cheaper than those offered by public and private 4-year institutions of higher learning (Joy, 2013).<sup>1</sup> Community colleges serve nearly half of the undergraduate students in this country with the average age of the community college student being 29 years of age. In addition to providing training for students planning to continue their education at the 4-year college/university, community colleges also work

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<sup>1</sup> According to the Community College Board website (2014), for the 2012-2013 school year the average cost to attend a public 4-year institution of higher learning was \$14,300. This figure takes into account tuition, room, and board. In contrast, the average cost to attend a community college was \$10,496 for tuition, room and board. Figures are representative of in-state students only.

with individuals who may be taking non-credit classes, workforce development, and/or skills training (“Community College Trends and Statistics,” n.d.). The majority of the new jobs currently being created in 2014 are jobs requiring some post-secondary education (“Community College Trends and Statistics,” n.d.). With nearly half of the community college students receiving financial aid, the community college is a gateway for many students who would not have been able to continue their education otherwise. Many of the students making up the community college population are minorities, low income, or first generation college students (“Community College Trends and Statistics,” n.d.). According to the American Association for Community Colleges, 61% of the community college population in 2013 was made up of women, and the women making up the majority of the community college population has been a continuing trend beginning in 1985. In terms of ethnicity, Caucasians made up the largest group with 68%, Blacks were at 27%, and Hispanic, Asian, and races unknown each scored at 1% (“Community College Trends and Statistics,” n.d.).

Community colleges serve a diverse group of individuals ranging from students who may want to upgrade their employability skills, to students who are looking to transfer to the university, to students who are just taking a course as a hobby or to learn something new. Community colleges can also provide a way for many non-traditional students to continue their education while they work. As of 2013, more students were enrolled part-time (59%) at the community college than full-time (41%) (“Community College Trends and Statistics,” n.d.). Not only are community colleges serving older students, but younger students are being served as well. Traditional age college students are increasing in numbers at the community college, as well as high school students

attempting to get ahead in their college education by enrolling in dual enrollment courses (“Community College Trends and Statistics,” n.d.).

Over half of the students earning undergraduate degrees in this country attend a community college for a portion of their coursework. Educating a workforce helps stimulate local and state economies (“Community College Trends and Statistics,” n.d.). Because of the recession in 2008, many students opted to enroll in community college to pursue a college degree due to the lower costs of tuition as compared to the 4-year institutions (Joy, 2013). Statistics show that students who attend community college are more successful in attaining an Associate’s degree and a degree after they transfer to a 4-year institution. Students who attended community college were more likely to attain a degree at a 4-year institution and still be in pursuit of a 4-year degree, or to attain an associate’s degree at the community college (“Community College Trends and Statistics,” n.d.).

#### *Community College Statistics in Local State*

Demographics for the state where the current research study occurred are similar to the national trends. Women still make up the majority of the student population with 61% of the students being women and 39% being male. The number of full-time students however, is substantially different with 73% of the students in the state being full-time as compared to the national average being 41%. Enrollment by ethnicity is also similar with 59% being Caucasian, 36% black, race unknown at 2%, Asian, Hispanic, and Indian each being 1% (“Community College Trends and Statistics,” n.d.).



*Community College Statistics for Research Institution*

Demographics for the local institution where the research study was conducted closely resembled state and national trends. Women make up the majority of the student population with 60.9% and 39.1% being male. The average age of students at the local institution is 21 years of age compared to the national average of 29 years of age. The number of full-time students is 76% as compared to part-time 24%. Enrollment by ethnicity is also similar with 63.1% being Caucasian, 33.3% Black, race unknown at 0.7%, Asian, 1.5%, and Hispanic and Indian each being 0.1% (“Northwest Mississippi Community College Fact Sheet, 2014” n.d.).

Community college students make up a very diverse population. Traditionally, women make up the majority of the student population, and students are likely from lower socioeconomic status in pursuit of advanced degrees. These same demographics traditionally score lower in areas of computer skills and computer self-efficacy. To ensure these students have the necessary technological skills to succeed in their pursuit of a college degree, it is essential is to not assume these students have the computer skills needed to be successful in their coursework and are prepared for transfer to the university and professional careers.

This dissertation study aims to prove that to ensure student success, a test-out option is needed to assess which students have the computer skills and which students do not. This study has the potential benefit of incorporating a change in the academic core curriculum of the college to include a way for students to bypass the computer concepts core requirement by having a test-out option. Another benefit of the study would be if student’s show computer literacy through the test-out option they could bypass the

computer class all together or take a more advanced computer class. Currently college advisors at the college are relying on students' computer self-efficacy as a method of placing students in computer courses.

### Computer Skills of College Students

Although hard to imagine, there are still college students today who do not know how to use computers. According to Uraski (2009), who evaluated computer skills of incoming students attending Hawaii Community College, many students did not have a basic level of computer literacy. Skills that Uraski defines as basic are using a computer to register for classes, checking email using the student information system, and using other college services available online. Uraski's study consisted of a pre-semester one-day, six-hour workshop to help students develop some of these basic technology skills. The workshop was voluntary and advertised to students who completed placement testing. Participants were surveyed through pre- and post-workshop surveys at the beginning of the technology workshop and at the conclusion of the technology workshop. Follow-up telephone interviews were also conducted six weeks after the workshop to evaluate the participants' perceptions of the computer skills developed as a result of the workshop. Their experiences about having completed the workshop were also noted. Results from the post-workshop survey reflected positive gains upon completing the workshop. Additionally, findings showed in the six-week phone interview that there was relatively no loss of skills. All participants indicated that the workshop was important for new, incoming students.

In a study about an undisclosed community college in the Southeastern region of the United States, Ratliff (2009) suggested that the responsibility of higher education is to

assess the technological skills of incoming students. To determine if incoming entering college freshman had the necessary skills to be successful, instructors collaborated and developed questions to assess the following areas: personal computer basics (i.e., file and directory management), application basics (i.e., word processing, spreadsheet, and presentation skills), and Internet Basics (i.e., how to upload a file, e-mail, and Web browsers). When the technology assessment was administered to 182 incoming freshman attending orientation (177 were high school seniors and five were non-traditional students), the mean score was 77.07% for the group. Of the 182 participants, 41% of the students scored at or below the 75<sup>th</sup> percentile. Four additional orientation sessions were conducted with an additional 149 students taking the assessment; 48% of these scored below the 75<sup>th</sup> percentile. The average age of the students participating was 19.8 years of age. Results from this study indicated that a significant number of students were not prepared for a technology rich learning environment despite having grown up with technology.

In a study by Grant and colleagues (2009) of undergraduate students enrolled in an introductory business computer applications course, students' perceived computer skills were compared to actual scores on a computer assessment at time of enrollment. The college was a medium sized public university in the Eastern region of the United States. Two hundred thirty five students spread across 12 sections were included in the study. The purpose of the study was to compare and analyze students' computer self-efficacy (i.e., low, average, and high) and actual performance in three areas (i.e., word processing, presentation graphics, and spreadsheets).

The students in the study were given a survey prior to taking the pre-test assessment instrument asking their perceived knowledge of Microsoft Word, Excel, and PowerPoint. Seventy-five percent of the students viewed their skills in Word to be high; however, less than 50% were able to answer correctly questions pertaining to advanced tasks. When students were asked how confident they were in their abilities to complete basic, moderate, and advanced spreadsheet tasks, their computer self-efficacy was much lower. In viewing the results from the assessment, the spreadsheet scores were aligned with the students' perceptions, and most students could perform only two of the five basic tasks. When students' perceptions of their presentation skills were tested (81%), they said that their skills were at least average, yet they could correctly answer only two basic tasks.

In a study conducted by Goode (2010) at a large research institution in California, findings showed that students have a deep integrated foundation of technology in their social and academic lives. However, results showed that low-income students and females came up short in terms of technology skills. Goode's research showed disparities in technological skills where economic class, race, and gender were concerned. In addition, students with lower technological skills were likely to avoid classes with intensive technology components, while students that are more proficient in technological skills gained academic and social benefits such as time and money from being knowledgeable in technology.

Ritz (2011) conducted a study of 256 students to evaluate their attitudes and knowledge gained from completing a general technology foundations course. The course was a 100-level course designed to expose students to different types of technology to

help them in choosing a major. Faculty members had been attempting for over 30 years to make a technology literacy course for liberal studies students a course requirement. The intent of the foundation course was to show students how technology influenced all careers regardless of discipline. Another intention of the course was to help first-year students become better educated when selecting a career and a major. In the foundation 300-level course, students could select cluster courses coming from an inter-disciplinary perspective.

In an effort to protect the advancements made in adding the technology literacy course into the general education curriculum, faculty decided to measure student progress of those who had been enrolled in the foundations course. Over a two-year period, students were surveyed to collect feedback. Three constructs were evaluated in the study: Impacts of Technology, Technology Working Knowledge, and Technology in Careers. Data collected revealed surprisingly that 64% of students had never taken a technology course. Ritz cites this as being one of the most surprising findings in the study. Because of the research data collected, the course was able to remain as part of the liberal studies course requirement.

Many older non-traditional students are returning to school now in pursuit of college degrees with the advent of online degree offerings (Sivakumaran & Lux, 2011). However, many are finding in addition to learning course content, they must navigate in a technological environment. Some students feel intimidated by learning both course content and technology, and this can increase their anxiety and stress due to learning through an unfamiliar medium (Heflin, 2015; Sivakumaran & Lux, 2011).

Colleges and universities expect entering students to be able to perform basic operations on a computer, and they assume that students have these skills such as the ability to complete an online business transaction, navigate the Internet, send an email, search a database, and use word processing (Anderson & Horn, 2012; Goode 2010; Messineo & DeOllos, 2005; Uraski, 2009). Higher education faculty also expect entering freshman to be able to perform basic computer functions, and they may assume students today are more competent with technology (Anderson & Horn 2012; Heflin, 2015; Lazim et al., 2011; Messineo & DeOllos, 2005; Ratliff, 2009; Uraski, 2009). University faculty and administrators can no longer assume students possess these computer skills.

In a study conducted by Heflin (2015), college administrators were surveyed regarding lack of computer preparation that hinders high school graduates. Participants commented that students are given preliminary assessments in reading, mathematics, English, and writing, but not on the subject of computers. Contributors went on to say that a large number of United States college students have the necessary computer skills coming out of high school however many do not. Students from foreign countries may not be as exposed to computers as much as United States students are and those students must be considered. This dissertation study shows that screening mechanisms, such as a test, must be put in place to verify that students possess the computer skills needed to be successful in degree programs one may be pursuing and in the workforce.

#### Self-Efficacy Theory (SET)

Self-efficacy theory suggests that those individuals who believe or judge themselves as being able to accomplish a task or activity will likely attempt and successfully perform the task or activity (Murphy, Coover, & Stevens, 1988; Sun &

Rueda, 2012). Bandura (1995, 1997, 1999) defined *perceived self-efficacy* as “beliefs in one’s capabilities to organize and execute the courses of action required to manage prospective situations” (p. 2). Self-efficacy is not the same as actual knowledge of how to complete a task, and it is different from self-esteem, which refers to one’s feelings of self-worth (Brown, 2008). Self-efficacy is situational and greatly affects how much effort people spend trying to accomplish a task, how they overcome difficulties or obstacles when fulfilling a task, and how much time they spend trying to overcome difficulties (Brown, 2008). Self-efficacy is often reflective of an individual’s past performance and experiences, but can also influence future intentions towards a task (Grant et al., 2009).

People strive to maintain control over their own lives. Predictability and understanding foster human attainment and well-being. Successes foster motivation and confidence in oneself and personal efficacy. Although there are many motivational constructs, self-efficacy is the cornerstone for promoting students’ engagement for learning (Sun & Rueda, 2012). These context-specific and domain-specific opinions affect performance and influence the choices people make and the course of actions they follow (Sun & Rueda, 2012).

Self-efficacy learning theory originates from *social cognitive theory* (Bandura, 1986, 1995, 1997, 1999; Hauser et al., 2012; Hsiao et al., 2012). Social cognitive theory suggests that behaviors, cognition, environment, and physiological influences are all interrelated, and this helps individuals conduct self-appraisals of their own desired personal goals. This theory proposes that all people learn from a variety of experiences (Money, 1995; O’Fallon & Butterfield, 2012; Wan, Compeau, & Haggerty, 2012). Individuals with high levels of self-efficacy have the perception that they are capable of

performing certain tasks or activities and consequently, are more likely to attempt to perform these tasks. People who have the perception that they are less capable to complete tasks are less likely to attempt these tasks and activities and have lower self-efficacy (Hong, Chiu, Shih, & Lin, 2012; Karsten, 2000).

Through a variety of research studies across a multitude of research domains, self-efficacy has consistently been a strong indicator of subsequent task-specific performance (Karsten, 2000). Bandura suggests individuals have the ability to make judgments on individual capabilities through self-referent thought, action, and affect (Murphy et al., 1988). People gain efficacy based on cues from different sources, and individuals use this information to make judgments of efficacy, which may be true or inaccurate (Murphy et al., 1988). According to Murphy and colleagues (1988), “there are four sources of efficacy information, in order of potency of their effect, include performance accomplishments, vicarious learning experiences, verbal persuasion, and affective arousal” (p. 4). Individuals take this information, they consider the data, and they form judgments of capability. These self-appraisals serve as “cognitive mediators of action” (Bandura, 1986, p. 6). Based on self-appraisals, individuals then determine whether they will decide to attempt or not attempt a task or activity. Most individuals have a tendency to remain with activities or tasks in which they possess efficacy. Individuals either avoid the tasks or likely are not successful in tasks or activities not falling in their range of efficacy (Murphy et al., 1988).

Bandura (1995, 1997, 1999) cites four ways of fostering self-efficacy. The first is through *mastery experience*, and this is the most effective way for one to build and develop self-efficacy. Failures have an adverse reaction on one’s self-efficacy,



particularly if failure occurs before an individual develops a strong sense of efficacy. Developing a strong sense of self-efficacy is accomplished, not through easily attained successes, but by accomplishing cognitive, behavioral, and self-regulatory tools for managing day-to-day in life's ever-changing events. A robust sense of self-efficacy is developed through individuals learning how to overcome hardships along the way; simultaneously, setbacks serve as teachable opportunities for individuals to learn through their independent experiences (Bandura, 1995, 1997, 1999).

The second way to develop self-efficacy is through *vicarious experiences*. When individuals see someone succeed, the observed success fosters the idea that they too can attain the same goal. However, the process has the same effect if observers witness an attempt on an activity that fails. The observers will likely question their own efficacy and may lose the motivation sought instead of moving forward (Bandura, 1995, 1997, 1999).

*Social persuasion* is the third method of developing self-efficacy. Individuals who are persuaded verbally that they have what is necessary to be successful are more likely to attempt to accomplish a goal/task and to diminish any intrinsic self-doubt when problems arise. Similarly, individuals who have been told that they do not have the skills needed to succeed have a tendency to avoid trying altogether (Bandura, 1995, 1997, 1999).

The fourth way to foster self-efficacy is through *enhancing one's physical status*. Through reducing stress and removing negative emotional tendencies, physical status could rise, creating a positive effect on one's beliefs of personal efficacy. Those who are full of self-doubt look at arousal as debilitating (Bandura, 1995, 1997, 1999). Thus,

reducing the causal inducers such as stress and negativity should have a positive outcome to prompt personal efficacy.

A host of factors can alter a person's intrinsic self-efficacy. Which one plays the vital role is dependent on the individual and his or her predeterminations of abilities, how difficult the task is for the individual, the amount of effort the person is willing to put forth, and what kind of emotional state the individual has at the time of the occurrence (Bandura, 1995, 1997, 1999). Self-efficacy is not only reflective of the perception of one's ability to complete a task based on past performance or experience but can also form critical influence on future attempts to fulfill a particular goal or task (Karsten, 2000).

According to Bandura (1997), efficacy opportunities vary by many dimensions and all have important implications. Bandura (1977) states, "Self-efficacy has three dimensions. Magnitude applies to the level of task difficulty that a person believes he or she can attain. Strength refers to whether the conviction regarding magnitude is strong or weak. Generality indicates the degree to which the expectation is generalized across situations" (p. 194). An example of this would be tasks ordered in degree of difficulty. Tasks could be arranged in order of least difficult to most difficult. In this particular situation, the efficacy of an individual would depend on how they answered the questions in varying degrees of difficulty. Those individuals who have a greater sense of self-efficacy would institute coping tactics to work through the more difficult questions despite disconfirming emotions. Through some experiences, a limited expectation can be formed and this can create a generalized sense of efficacy which can proceed to impact a variety of different tasks and situations later on (Murphy et al., 1988).

Self-efficacy is a strong indicator of subsequent task-specific performance. For students to attempt to try something new, they must have a strong sense of self-efficacy. Prior experience gives students a greater sense of self-efficacy, which encourages them to troubleshoot in an attempt to figure something out that they may find difficult. Students who have had experience working with technology or certain types of software have a great sense of self-efficacy. Experiences in turn will build self-efficacy and likely influence their later attempts to figure out tasks they may have limited knowledge. This dissertation study examined whether a correlation between computer self-efficacy and computer skills exists among college students. Currently the college is placing students in computer courses based on how students rate their computer self-efficacy. The study examined if CSE is a reliable indicator of actual computer knowledge.

#### Computer Self-Efficacy Theory (CSE)

Research has shown that computer self-efficacy has had a direct influence on classroom performance (Hauser et al., 2012). Compeau and Higgins (1995) defined computer self-efficacy (CSE) as one's perceived ability to use a computer to accomplish a task. According to Hauser and colleagues (2012), general computer self-efficacy refers to the belief that a subject can perform well across a variety of computer tasks; specific computer self-efficacy refers to the belief that the subject can perform well using a particular technology such as programming, database development, etc.

A number of antecedents have been studied concerning computer self-efficacy and how self-efficacy affects outcomes. These antecedents include previous success, support and encouragement from the instructor, acquired skills, demographics (gender, age, experience), and intrinsic beliefs (apprehension/self-confidence) (Hauser et al.,

2012; Sun & Rueda, 2012). Outcome expectancy refers to the take away (knowledge attained) that people hope to walk away with after a task has been accomplished (Sun & Rueda, 2012). Many researchers have found that training and experience in computer technology can have significant impact on students' computer self-efficacy (Sun & Rueda, 2012).

In their study of three undergraduate sections of Introduction to Information Systems with a sample size of 148 students, Karsten and Roth (1998b) did not find any significant differences in computer self-efficacy, nor any significant differences in pre-test scores among the students. However, in the pre-test scores there was a high correlation in computer self-efficacy among students who had prior computer experience. Additionally, the post-test scores of computer self-efficacy of students completing the course were much higher. A surprising result was that students having prior computer experience and students completing a computer course all had a much higher sense of computer self-efficacy. In evaluating the final scores for prior computer experience, there was no significant association with concluding levels of computer self-efficacy. All students, regardless of prior experience or lack thereof, had a significant increase in computer self-efficacy. Morris (2010) when evaluating computer self-efficacy in community college students who had taken computer courses in high school found similar findings; revealing students had higher levels of computer self-efficacy that completed three or more computer classes in high school.

Gender differences have consistently shown up in research of variables affecting attitudes towards computers. Boys have been shown to use computers much more than girls, and the boys have a tendency to show much more interest than girls do. Girls have a

tendency to become more stressed when using computers. The gender biases have been well documented in numerous countries, and they have been documented across all educational groups spanning from pre-school to college age. However, on a positive note, gender variances seem to be slowly dissipating (Gibbs, 2013).

Gibbs (2013) conducted a study of introductory level computer classes to investigate whether or not gender had differing levels of computer self-efficacy. Data was collected in 1999, and the data was then compared to data collected in 2012. Demographic information was collected such as gender and computer training prior to coming to college. Age was assessed in the 2012 sample but not in 1999. Survey participants were asked to rate their confidence using computers in the following ways: no confidence, a little confidence, average confidence, confident, and very confident. The response rate in 2012 was 80%—with 59% of the sample being males and 41% being female. Computing confidence results in 2012 among males was 3.23 (s.d. 0.78); females were only slightly lower at 3.13 (s.d. 0.72). The average age of the sample in 2012 was 21 years of age (Gibbs, 2013).

Age is another factor that can affect computer self-efficacy in many instances. In a study conducted by Brown (2008), computer self-efficacy was measured in adults 21 years of age and older. Perceptions of their computer skills across a wide span of age, gender, and ethnicity were evaluated in introductory-level computer training programs (program areas included academic, non-academic, work, and community centers). The training period spanned a length of six to eight weeks rather than a single session to build confidence. The sample was made up of 108 participants taking classes at libraries and at adult and continuing education classes at universities in the Midwest and East. The

instrument contained 36 items with 12 items in each of the following categories: hardware, software, and Internet. The overall means of each category were as follows: hardware 5.10, software 5.12, and Internet, 5.23. As a person's age increased, computer self-efficacy levels dropped. In the study ( $F=13.40$ ,  $p=.007$ ), the breakdown of each age group returned the following means: 21-39 years old ( $M=5.35$ ), 40-59 ( $M=5.17$ ), and 60-79 ( $M=4.08$ ).

Another factor influencing one's ability to perform computer-related tasks is *anxiety* (Chien, 2008; Celik & Yesilyurt; 2013; Hauser et al., 2012; Hong et al., 2012). According to the American Psychological Association (2014), "anxiety is an emotion characterized by feelings of tension, worried thoughts and physical changes like increased blood pressure (para. 1)." With *computer anxiety* or *technophobia*, an individual may experience a sense of fear or hesitation towards computers (Celik & Yesilyurt, 2013; Chien, 2008; Sivakumaran & Lux, 2011). Researchers have found that anxiety directly influences computer self-efficacy (Chien, 2008; Hauser, Paul, & Jeffrey, 2012).

In higher education, non-traditional students often find technology overwhelming when returning to school. Many adults want the subjects they are studying to utilize traditional teaching methods. However, they find that most college courses now have course management systems and other online resources to navigate. Students not only have to learn course content, but also they must learn the technology in order to be successful in the course. This places additional strain on the students to succeed in this new technological environment (Heflin, 2015; Sivakumaran & Lux, 2011).

With all of the factors present, examining how this may affect an individual's computer self-efficacy is important. Because low self-efficacy is associated with unpleasant feelings and apprehension, which may lead to task-avoidance, low computer self-efficacy can be associated with disengagement from computers. However, this does not seem to be happening. Instead, individuals with low computer self-efficacy do not shy away from computers necessarily, but are persistent with computers. As a result, more errors are made for this group, and they perform the tasks poorly (Shapka & Ferrari, 2003).

Research shows that students with higher rates of computer self-efficacy are more successful in the classroom. However, this dissertation study aimed to demonstrate that college and universities cannot continue to rely upon students' perceived Computer Self-efficacy when advising and making placement decisions in more advanced computer courses. Otherwise, students with low self-efficacy may fall into that group in which more errors and mistakes occur, thus diminishing a positive learning experience.

#### Assessing Computer Self-Efficacy

There are two predominant instruments that have been validated as reliable instruments in assessing general Computer Self-efficacy used as primary indicators: Christine A. Murphy's computer self-efficacy instrument developed in 1988 and Compeau and Higgins' computer self-efficacy instrument developed in 1995 (Karsten, 2000). Time can be an enormous factor with technology as the life span of usability is limited to around 10-15 years. Yet, both scales are generalized in how their questions are structured, and their alpha reliability makes them a consistent choice. Initially, both

scales appear as if they are capturing computer self-efficacy two different ways; however, both capture the strength dimension of computer self-efficacy (Karsten, 2000).

Murphy's 1988 computer self-efficacy instrument was developed during her dissertation in an attempt to measure computer self-efficacy. Bandura's theory of self-efficacy and Schunk's model of classroom learning guided the creation of the scale. The 32-item scale has become widely used as an instrument to measure perceptions of capabilities regarding specific computer-related self-efficacy. Each of the skill related items begins with the phrase "I feel confident," using a five-point Likert scale with one being least confident and five being very confident. Murphy's instrument captures the computer self-efficacy dimension of strength, and this can be operationalized as the sum or mean of the responses on the confidence scale counting "0" for a "no" response (Karsten, 2000). A reason for this scale being so widely used results from a principal factor analysis with oblique rotation producing a conceptually meaningful 3-factor solution as well as its high alpha reliabilities in which Murphy divided the 32 questions into three categories. The composition becomes the following when evaluating the factors: beginning skills, advanced skills, and mainframe skills. Once the data was analyzed, the alpha reliability estimates gathered for each of the factors were high enough to make the instrument suitable for research standards (Karsten, 2000; Murphy et al., 1988). Since 1988, the instrument has been used countless times, validating the instrument even further, and is considered to be a reliable instrument for assessing computer self-efficacy.

Compeau and Higgins' scale was initially reported in a 1995 study and consists of 10 questions listed in ascending order of difficulty. Each question begins with the phrase,



“I could complete the assignment using the software package...” and consists of a 10-point Likert-type confidence scale with one being “not at all confident” and 10 being “totally confident.” The scale captures two dimensions of computer self-efficacy—strength and magnitude. Magnitude is captured by the number of “Yes” responses to the confidence scale items. Strength is operationalized by the sum or mean of the responses on the confidence scale, counting “0” for no responses (Karsten, 2000).

While both instruments differ in structure, length, and computer self-efficacy dimensions assessed, both have proven to have value assessing computer self-efficacy in multiple studies over time. There is reasonable evidence to show that the findings in these studies offer evidence of high internal consistency and construct validity (Karsten, 2000). Both of these studies have had an enormous research contribution to the field of Computer Self-efficacy. While Bandura developed the theory of Computer Self-efficacy, both of these scales pioneered measurements of CSE for research and are highly respected in the field.

### Summary

Business and industry demand skills in technology more so now than ever before. Colleges and universities expect students to have a certain level of computer/technology knowledge when entering school. Just because Millennials have grown up immersed in a digital culture and are comfortable with technological devices, this does not mean that they have the necessary skills to use and understand computers.

Study after study shows students need basic Internet skills, such as how to send an email, search a database, conduct word processing, and operate spreadsheets; these skills are critical for success in colleges and universities today. Research shows that many

college students come up short in these skills, particularly women, minorities, low socioeconomic status, and non-traditional students. Colleges must stop assuming that students who have grown up with technology naturally have these necessary skills when they enter college. Measures need to be adopted to screen all students and place them in computer courses based on skill set. If students do not have the skills, the college or the university should require them to take a technology literacy course. Colleges do not place a student in a College Algebra class unless his or her ACT scores in math indicate the likelihood of success in the course. If an ACT score is not available, the entering student is tested to see if his or her ability matches those skills needed for success in the course. In some cases, students with high scores are routed around College Algebra and into higher math classes more appropriate for their stated majors. Computer skills should be screened in exactly the same way as math skills.

Chapter III will include the methodology of this study and will show the supporting data that was used to answer the three research questions that guide this dissertation study. Details will be provided of the research design, volunteers that participated in the study, the research setting, and the research instrument will be included in detail.

## CHAPTER III

### METHODOLOGY

#### Introduction

A review of literature supports the notion that in an age of students growing up connected, there are still college students today who do not know how to use computers (Burgess et al., 2012; Gibbs, 2008; Lazim et al., 2011; Ratliff, 2009; Tanner 2011; Uraski, 2009). Increased usage of computers and technology does not translate into having computer skills (Nelson et al., 2011; Uraski, 2009; Worley 2011). This study was conducted to assess if there is a connection among community college students' computer self-efficacy and their computer skills. The study investigated whether students' computer self-efficacy could be used as a gauge for actual computer knowledge (Bandura, 1995, 1997, 1999). Further, this study examined whether students' computer skills in the areas of computer hardware terminology, Windows, word processing, spreadsheet, and presentation software were sufficient to meet the objectives set by introductory computer concepts courses.

#### Research Setting

This study took place at a large community college in the Southeastern region of the United States. The college has existed for nearly 90 years and consists of five different locations across an 11-county geographical district. The college offers degrees in Associate of Arts, Associate of Applied Science, and Certificate. Classes from three campus locations were used in the research study. Two of the campus locations were omitted because the course (CSC 1113) was not offered at these campus locations because these locations are solely Career-Technical Centers.

CSC 1113, *Computer Concepts* is currently a required course for graduation in all degrees awarded at the community college where the dissertation study was performed. CSC 1113 is part of the academic core, similar to other general requirements like English and Mathematics. In recent years, the requirement has been debated as to whether the course should remain as part of the academic core. The college administration has expressed that the course may no longer be a necessary part of the degree because students have grown up with computers in a connected society. Thus, the administration believes that students are already accustomed to working with computers, have the basic computer literacy skills, and have the required knowledge to succeed in other courses that require computer literacy skills (e.g., typing a report in a word processor, calculating formulas in a spreadsheet). However, research has demonstrated that students who have been immersed in a digital culture do not automatically translate that experience into skills. While most youth are comfortable in the digital world, few of the youth have the knowledge and skills of computer applications deemed suitable for education or the workforce (Considine et al., 2009; Gibbs 2008; Tanner, 2011).

#### *Background of the Course CSC 1113*

CSC 1113 *Computer Concepts* was originally created in the early 1980s as an office appliance course, which included a variety of office machines such as a memory typewriter. In early days, the course had a Business and Office Applications prefix (BOA) because of the variety of office machines used to teach the class. This was the first introduction to equipment that would store data electronically. The equipment had a very limited amount of storage (approximately one-half page). Later a magnetic card typewriter was added to replace the limited memory typewriter. This would allow

students to store approximately one-page per card. At this point the course was renamed CSC 1113 *Introduction to Computers*, and all of the other equipment used in the course was omitted, and the course focused solely on the computer (M.E. Cocke, personal communication, July 25, 2014).

CSC 1113 *Computer Concepts* today is a freshman-level computer course that offers training in the areas of computer hardware/technology concepts, Windows/Operating Systems, and Microsoft Office applications (Word, Excel, and PowerPoint). The course serves as a foundation course for more advanced computer classes taught on campus. This course was formerly called *Introduction to Computers*, and was renamed in 2007 because instructors felt the course had a stigma for students by having the word “introduction” in the title (Williams, 2007).

The community college framework is articulated statewide with all of the other 15 community colleges. Instructors from each of the 15 community colleges meet every five years to align the curriculum and make changes as necessary. All 15 community colleges statewide have the same course title, same course description, and the same course goals to ensure successful transfer to the universities throughout the state. When a curriculum change is made, all of the community colleges throughout the state institute the change. The title change was one that all instructors statewide agreed needed to occur; this decision was not limited to only the community college examined in the study. CSC 1113 is a required course for all students receiving an Associate of Arts or an Associate of Applied Science at the college. A standard course syllabus for the course CSC 1113 has been included in Appendix A. This syllabus is used for all of the CSC 1113 course sections taught regardless of campus location and instructor.

CSC 1113 has been taught in computer labs as a hands-on, lab-based class since the late 1980s. The classes have been taught in the relatively same type of format since this time, consisting of lectures, demonstrations, textbook projects, exams, etc. with the exception of adding **Skills Assessment Manager (SAM)** in 2009. SAM is a product published by Cengage that allows students to work in a simulated environment for training and exams. Objectives are task-based and interactive for the students. Projects are also included in SAM that can be downloaded to a student's individual machine. The documents are encrypted so that when student upload them into the SAM software they can receive immediate feedback on how well they performed. Students are then able to make corrections as necessary. SAM has added a great benefit to the course by providing immediate feedback to the students and developing quality assurance in student's assignments. Students have also become much more proficient in following directions and proofing documents for errors.

Class size on campus is limited to how many computers are in each classroom. Classroom labs average 21 computers per lab. All of the labs are networked together with two shared networked laser printers. All computers have Internet connectivity, and each lab is a smart classroom with a teacher computer connected to a projector. In addition to classes being taught in a traditional classroom format in a lab-based setting, sections of this course are also available for students to take online.

#### *Computer Skills Covered in CSC 1113*

Course Content in CSC 1113 is outlined based on Misty Vermaat's (2016) textbook *Microsoft Office 2013 Introductory Enhanced Edition* Shelly Cashman Series. The course begins with students learning about computer hardware skills such as the

**Input Processing Output and Storage (IPOS) Cycle.** Students are educated on the different components of the computer and what each part primary purpose is. Different types of technology are also taught such as iPads, laptops, Internet skills, social networking, and networking devices. Operating systems using Windows are also taught focusing on navigation throughout the software, how to open a program application, and file/directory management. The course introduces students to Word Processing using the application Microsoft Word. In Microsoft Word, students create a flyer using clipart, fonts, and borders. Students also learn how to format a research paper utilizing footnotes, headers/footers, and the reference feature. The unit on spreadsheet applications uses the software Microsoft Excel; and students are taught the SUM, AVERAGE, MAX, and MIN functions along with how to create a chart in a worksheet. Lastly, students learn a presentation software using PowerPoint where students learn how to create a multi-level slide, importing graphics, different ways they can view a presentation, and incorporating sound and videos.

### Research Participants

The research population for this study consisted of freshman and sophomore community college students enrolled in 25 sections of an introductory computer course during the spring 2015 semester and the sample was one of convenience. Instructors were asked to volunteer whether or not their classes would participate, and eight sections opted to not participate. There were approximately 20-25 students in each section taught in a traditional face-to-face format. Online students were not a part of this study to ensure students answered questions with no outside assistance. Volunteers had to be at least 18

years of age to participate in the research study. The final breakdown consisted of only those participants that completed both the pre- and the post-course survey packet.

Course enrollment in the participating sections equaled 535 students at the start of the class term. Volunteers agreeing to complete the pre-course survey packet resulted in 457 students. The completion rate of the students enrolled in the participating sections at the beginning of the semester resulted in 85.42% finishing the survey packet. Class enrollment at the end of the term was 449. Student enrollment dropped by 31 students because of withdrawals from the course. Additionally, 47 students remained enrolled, but did not complete the course and stopped coming. The post-course survey packet was attempted by 406 students and of those students 81.74% ( $n = 367$ ) of the survey participants completed both the pre- and post- course survey packet.

The population at the community college in which the dissertation study was steered closely resembled state and national trends of community colleges. Women make up the majority of the student population with 60.9% and 39.1% being male. The average age of students is 21 years compared to the national average of 29 years of age. Full-time students make up 76% of the student body as compared to 24% of the students enrolled part-time. Enrollment by ethnicity is also similar to national averages with 63.1% being Caucasian, 33.3% being Black, 1.5% being Asian, .7% being unknown, .1% being Hispanic, and .1% being Indian (“Northwest Mississippi Community College Fact Sheet, 2014,” n.d.).

#### Instrumentation

The researcher obtained approval from The University of Southern Mississippi’s Institution Review Board to conduct the study (see Appendix B). Permission was



obtained from the participating community college to survey its students currently enrolled in the classes CSC 1113 *Computer Concepts* (see Appendix C). The researcher also obtained permission from Christine A. Murphy to use the Computer Self Efficacy instrument developed by her in 1988 (see Appendix D).

#### *Survey Packet.*

The survey packet included a letter to potential participants outlining what the study entailed (see Appendix E), a demographic questionnaire, and Christine A. Murphy's 1988 Computer Self-efficacy instrument. The survey packet also included a 50-question objective test to assess computer skills in the areas of computer hardware/technology, Windows, Word, Excel, and PowerPoint was developed by the researcher based on material and tests currently used by CSC 1113 instructors in the classes throughout the semester. The survey packet was the same in both the pre- and post-tests with exception of demographics instrument not being included in the post-test survey packet.

#### *Demographics.*

Respondents were asked on the demographic portion of the pre-test survey packet (see Appendix F) to provide information that was comprised of the following information: students' identification number provided by the college, if they were 18 years of age or older, gender, ethnic background, highest degree completed, current situation, if the high school the participant attended required students to take a computer course, whether or not the high school the participant attended offered computer courses as electives, how many computer courses the participants completed in high school, the typical amount of time students spend daily on the computer, if they owned a smart

phone connected to the Internet, and if there was a computer in the home connected to the Internet other than a cell phone. The instrument is in the format of multiple-choice questions. Students were asked to provide their student identification number assigned by the research institution to match demographic information with other instruments used in the research study.

Hispanic and Latino groups were combined for the post hoc statistical analysis since only one participant identified with being from the Latino race. Within the sample, the two largest groups were African American ( $n = 214$ ) and White/Caucasian ( $n = 217$ ). When comparing pre-test survey packet scores among varying education levels focusing on G.E.D., High School graduates, Certificate, and Associate's the largest group was High School graduates ( $n = 408$ ).

#### *Computer Self Efficacy Scale*

According to Bandura (1997), there is no definitive way of measuring CSE. There are two frequently employed instruments to assess computer self-efficacy that are used time and again in conducting research. While both instruments have been used, each has a different approach in how to gauge CSE. The oldest instrument, developed by Christine A. Murphy in 1988, attempts to measure an individual's perceptions of his or her ability to accomplish specific tasks and activities involved in operating a computer. The newer instrument, developed by Compeau and Higgins in 1995, uses the approach of an individual's perceptions of his or her ability to use a computer application in the accomplishment of a job (Karsten, 2000). The instrument developed by Christine A. Murphy was more appropriate for determining students' computer self-efficacy for this research study because this instrument is more specific in targeting specific tasks related

to operating a computer. With Christine A. Murphy's permission, using this CSE instrument assisted the researcher in answering whether or not CSE correlates with computer skill level.

As part of the pre- and post-survey packet, students were given a Computer Self-Efficacy (CSE) scale (Appendix G) to rate students' beliefs in their computer skills in the areas of computer hardware, handling files/data storage, and working with application software. The purpose of attaining students' computer self-efficacy at the beginning and at the conclusion of the course was to evaluate whether or not taking the course CSC 1113 affected students' CSE. The pre- and post-survey packet portion containing the computer self-efficacy scale was critical for the researcher to answer Research Questions 1A, 2, and 3A. The CSE scale consisted of a 32-question instrument. Responses range on a five-point Likert-type scale with 1 being "Strongly Disagree" and 5 being "Strongly Agree." Each item begins with the statement "I feel confident" and the instrument asked questions such as "I feel confident organizing and managing files." Murphy's CSE scale measures only the strength dimension of CSE. How the scale calculates the strength dimension of CSE is by calculating the average or mean of the responses to the scaled items. The higher the mean score the greater the CSE score. Minor changes were made to the instrument with Murphy's permission to fit today's technology. An example of this would be instead of asking, *I feel confident handling a floppy disc correctly*, the researcher omitted the word floppy, so the question reads, *I feel confident handling a disc correctly*. All of the changes have been noted in parenthesis to the right of each question in Appendix F.

In the 32-item scale developed by Murphy and colleagues (1988) three factors were evaluated: beginning level, advanced level, and mainframe skills. These three measures have been of great interest and use to computer educators and trainers providing awareness of different computing behaviors (Marakas, Yi, & Johnson, 1998). Harrison and Rainer (1992) found that age had a negative relationship to CSE, males possessed significantly higher degrees of computer self-efficacy than their female counterparts did, and experience with computers was positively correlated to CSE. Consequent studies have found that an individual's computer self-efficacy will increase after participation in a semester long computer class regardless of a person's age or gender (Karsten & Roth, 1998a, 1998b; Torkzadeh & Koufterous, 1994).

#### *Computer Skills-based Questionnaire*

The researcher developed and designed the portion of the survey packet containing the computer skills-based instrument consisting of a 50-question objective-based questionnaire (see Appendix H) to evaluate students' skills in the areas of computer hardware/technology, Windows, word processing, spreadsheets, and presentation software. Students were provided four answer choices for each question A, B, C, or D. Questions are related directly to objectives covered in the CSC 1113

*Computer Concepts* course from each of the topics covered throughout the semester: Computer Hardware/Technology Skills, Windows/Operating Systems, Word Processing, Spreadsheet Applications, and Presentation Skills. The researcher contributed an average of 10 questions from the different content areas to assess each of the skills. The questions were not necessarily grouped together by the skill being evaluated. In order to score each skill, the researcher graded each instrument by hand. The researcher then calculated a

graded average for each participant in the corresponding content areas and recorded the scores in SPSS.

The variables used in this study to assess the skills based portion of the study were as follows: (a) Hardware/Technology Skills, (b) Operating Systems, (c) Word Processing Software, (d) Spreadsheet Software, and (e) Presentation Software. Table 1 below illustrates which variables correspond to the survey questions and related research questions.

Table 1

*Relationship of Skills-based Variables, Survey Questions, and Research Questions*

Variable	Survey Questions	Research Question
Hardware/Technology Skills	1-5, 7-11	1B & 3B
Windows/Operating Systems	6, 12-19, 29	1B & 3B
Word Processing Software	20-28, 30-32	1B & 3B
Spreadsheets Software	33-42	1B & 3B
Presentation Software	29, 43-50	1B & 3B

#### Procedures

After the successful defense of the research proposal, the solicitation of CSC 1113 instructors willing to allow their class sections to participate occurred. Instructors teaching traditional classes of CSC 1113 on three different campuses were asked face-to-face or via email by the researcher if they would be willing to distribute the instruments in their classes via paper/pencil method the first week of the spring 2015 semester. Eleven instructors agreed to participate and two instructors opted not to participate. The researcher also explained to instructors willing to participate that the same instruments

was to be administered again in the last week of April 2015 with the exception of the demographic instrument. Instructors were told they would receive a \$25.00 Amazon gift card for their participation as a thank you. Thirty-three sections of CSC 1113 participated in the research study system wide. Two of these 33 sections were taught by the researcher. The researcher obtained permission from the participating community college to survey students currently enrolled in traditional CSC 1113 courses. Upon receiving permission from The University of Southern Mississippi's Institution Review Board, the researcher personally distributed the instruments to the participating nine CSC 1113 instructors.

A cover letter (Appendix E) was then composed to accompany each of the survey instruments that told students their participation in the research study was voluntary and that participation was a two-part process. Students were also told if they wanted to opt out of participating at any time, they could do so. The letter also explained the purpose of the survey, informed them that they must be 18 years of age or older to participate, and whether or not they participated in the survey would no way influence their grades in the class. Additionally, the letter stated that students who did not wish to participate or students who were not 18 years of age or older should return the survey packet back to their instructor.

The researcher distributed the survey packets consisting of a cover letter to students, a demographic questionnaire, the computer self-efficacy scale, and the 50-question computer skills based questionnaire to three campuses in the first week of class during the spring 2015 semester. As instructors distributed and collected the surveys in their CSC 1113 classes, they contacted the researcher to arrange for the completed instruments to be picked up. Once mid-April arrived, the researcher contacted the

participating instructors to arrange distribution of the post-survey packets. Instructors once again distributed the same survey packets to the same class sections minus the demographic portion of the instrument. Pickup times and locations were arranged by the researcher to collect the completed post- survey packets on the different campuses. Pre-tests and post-survey packets were then matched to participants based on each student's identification number assigned by the college and entered into SPSS.

### Analysis

The researcher utilized SPSS software to obtain necessary descriptive statistics and analyze the collected data. Analysis of data using frequencies, means, correlations, one-way Analysis of Variance (ANOVA), and repeated measures ANOVA were used to compare students' computer self-efficacy and computer skills at the beginning and end of the course CSC 1113. The designs of the following research questions address students' Computer Self Efficacy and computer knowledge as a community college student were the focus of this study:

R1a: Is there a difference in demographics (gender, race, education) regarding computer self-efficacy prior to taking the CSC 1113 course?

R1b: Is there a difference in demographics (gender, race, education) in skills assessment scores prior to taking the CSC 1113 course?

R2: Does the number of computer courses taken in high school correlate to the computer self-efficacy prior to taking the CSC 1113 course?

R3a: Do pre- and post-CSE scores differ as a result of taking the CSC 1113 course?

R3b: Do pre- and post-skills assessment test scores differ as a result of taking the CSC 1113 course?

A series of one-way ANOVAs was used to investigate if there was a difference in CSE and Computer Skills in different demographics such as gender, race, and education prior to taking the course CSC 1113 as referenced in Research Questions 1A and 1B. A bivariate correlation was used to see if the number of computer courses students took in high school affected computer self-efficacy at the beginning of the course CSC 1113 as referenced in Question 2. A Repeated Measures ANOVA measured if pre- and post-CSE scores and computer skills increased as a result of taking the course CSC 1113 as referenced in Research Questions 3A and 3B.

#### Summary

The research design most appropriate for this study was a series of one-way ANOVAs and a bivariate correlation. Only traditional face-to-face CSC 1113 classes in which the instructor agreed to participate were assessed. Students enrolled in participating CSC 1113 sections were given the option to voluntarily participate in the study. Those who volunteered were requested to answer a survey packet the first week of class and an identical survey packet at the conclusion of the semester with the exception of the demographics portion of the packet. The pre-/post-survey arrangement used the same student population. The test formats for the pre- and post-survey instruments was the paper/pencil method.

The next chapter presents the results of the research study. Research variables were analyzed in order to determine the relationship between students' computer literacy



skills and computer self-efficacy. The researcher looked particularly at skills of students coming into the course CSC 1113 and skills before and after the CSC 1113 course.

## CHAPTER IV

### RESULTS

#### Introduction

This dissertation study's purpose was to investigate whether or not computer self-efficacy is a reliable indicator of computer knowledge. Computer knowledge as defined by this study encompasses an introduction to technology, Windows operating systems, and Office applications Word, Excel, and PowerPoint prior to students taking CSC 1113 and how those variables are impacted by demographic factors and as a result of completion of the course.

#### Final Participants

The final participants for this dissertation consisted of community college students enrolled in 25 sections of the course CSC 1113, *Computer Concepts*. Course enrollment in the participating sections equaled 535 students at the beginning of the semester. As outlined in Figure 2, the pre-course Computer Self Efficacy (CSE) survey and skills based instrument were voluntarily answered by 457 students. Of the students enrolled in the participating sections at the beginning of the semester, 85.42% ( $n = 367$ ) volunteered to participate in the survey. At the semester's conclusion, class enrollment equaled 449. Due to students withdrawing from the course, enrollment had declined by 31 students, and 47 students simply quit attending class resulting in those students not finishing the course. The post-course CSE survey and skills-based instrument were attempted by 406 students and 77.83% ( $n = 316$ ) of the survey participants completed both the pre- and post-test CSE and skills based instrument.

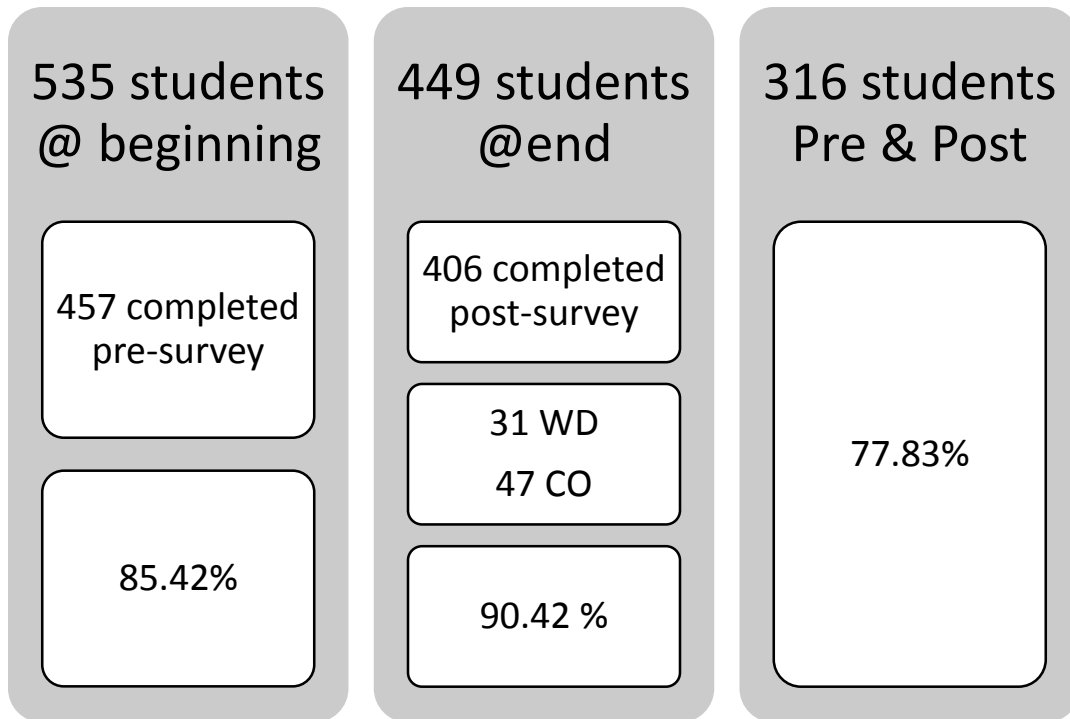


Figure 2. Final Participants

#### Descriptive Data

All participants in this research project were 18 years of age or older. Table 2 displays the self-reported characteristics of the participants according to gender, ethnic background, highest degree completed, current situation, if they were required to take a computer course in high school, if there were computer courses offered as electives in high school, the number of computer classes taken in high school, the average amount of time spent daily on the computer, if they owned a smart phone connected to the Internet, and if there was a computer in the home connected to the Internet other than a cell phone. Responses to the pre- survey packet totaled 457, with 58.6% females and 41.4% males. Within the sample, the two largest groups were African American ( $n = 214$ ) and White/Caucasian ( $n = 217$ ). Hispanic and Latino groups were combined for the post hoc statistical analysis because only one participant identified with being from the Latino

race. When comparing CSE scores of students among varying education levels focusing on G.E.D., High School graduates, Certificate, and Associate's the largest group was High School graduates ( $n = 408$ ) at the beginning of the semester in the pre- survey packet.

In addition to computer use and time spent on a computer, computer training has also been found to increase computer self-efficacy (Bandura, 1995, 1997, & 1999). The majority of survey respondents (69.4%) indicated that they were required to take a computer class in high school, and 67.3% reported that their high school offered computer courses as electives. Students having prior computer experience and students completing a computer course all had a much higher sense of computer self-efficacy (Karsten & Roth, 1998b), as part of the demographic information collected respondents were asked how many high school computer classes they completed. The majority of the respondents answered one course at 35.3% and two courses came closely behind at 30.8%. See Table 2 for a complete overview of the demographics for the participant pool.

Table 2

*Demographic Descriptive Statistics (n =367)*

Demographics	n	%
18 years or older	367	100
Gender		
Male	189	38.1
Female	268	54
Ethnicity		
African American	214	43.1
Arab	0	
Asian/Pacific Islander	2	.4
Caucasian/White	217	43.8
Hispanic	7	1.4
Latino	1	.2

Table 2 (continued).

Demographics	n	%
Ethnicity, ctd.		
Multi-racial	10	2
Would prefer to not say	6	1.2
Highest Degree Completed		
G.E.D.	27	5.4
High School Diploma	408	82.3
Certificate	17	3.4
Associates	4	.8
Which of the following best describes your situation		
Recently graduated H.S. and pursuing degree	349	70.4
Recently earned G.E.D. and pursuing degree	14	2.8
Been in workforce and returning to school	59	11.9
Taking class for fun to learn something new	4	.8
None of these apply	29	5.8
Required to take computer course in High School		
Yes	344	69.4
No	98	19.8
Don't know	15	3
Computer courses offered as elective classes at your High School		
Yes	334	67.3
No	79	15.9
Don't know	44	8.9
Number of computer classes taken in High School		
0 classes	91	18.3
1 class	175	35.3
2 classes	153	30.8
3 classes	30	6
More than 3 classes	7	1.4
Average hours per day spent on computer		
0-2 hrs.	236	47.6
3-4 hrs.	133	26.8
5-6 hrs.	47	9.5
7-8 hrs.	21	4.2
9-10 hrs.	6	1.2
> 10 hrs.	13	2.6

Table 2 (continued).

Demographics	n	%
Has a smartphone connected to Internet		
Yes	443	89.3
No	13	2.6
Don't know	1	.2
Computer in home connected to Internet other than cellphone		
Yes	377	76.0
No	79	15.9
Don't know	1	.2

### Findings

The following describes the findings gathered from the two surveys, Murphy et al., (1988) Computer Self Efficacy Scale and Computer Skills-based Questionnaire. Results were analyzed using a series of one-way ANOVAs, bivariate correlation, and repeated measures ANOVA. Results are reported according to the three research questions for this study.

#### *Research Question 1*

Research question number 1 had been divided into two sub-questions. The questions examined whether a difference existed between the demographic variables of gender, race, and education with computer self-efficacy and skill assessment prior to taking the computer course CSC 1113.

*Research Question 1a.* For Research Question 1a, “Is there a difference in demographics (gender, race, education) regarding computer self-efficacy prior to taking the CSC 1113 course?” a one-way ANOVA statistical analysis was conducted. The independent variables for this research question were the demographic variables, which were categorical. For the variable of gender, two levels existed between males and

females. For the race variable, seven levels existed including African American, Arab, Asian/Pacific Islander, Caucasian/White, Hispanic/Latino, Multi-racial, and Rather not say. For the education variable, four levels existed including G.E.D, High school diploma, Certificate, and Associate. The dependent variable was the score on the computer self-efficacy prior to taking the CSC 1113 course, which was a continuous variable. Descriptive statistics indicated that of the sample group, 457 students completed the pre-course assessments, including the demographics, pre-CSE survey, and pre-test skills assessment.

Assuming homogeneity of variance, computer self-efficacy scores for men and women at the beginning of the CSC 1113 course were not significantly different [ $F(1, 485) = .575, p = .449$ ]. The mean pre-CSE score for men was 3.93 ( $s.d. = .697$ ) and the mean pre-CSE score for women was 3.98 ( $s.d. = .709$ ).

Within the sample, the two largest groups were African American ( $n = 214$ ) and White/Caucasian ( $n = 217$ ). Similarly, assuming homogeneity of variance, computer self-efficacy scores between racial groups at the start of the CSC 1113 course were not significantly different [ $F(3.11, 222.50) = 1.262, p = .279$ ]. The mean pre-CSE scores for the racial groups were as follows: African American was 3.92 ( $s.d. = .702$ ), Caucasian/White was 3.98 ( $s.d. = .71$ ), Asian/Pacific Islander was 4.61 ( $s.d. = .110$ ), Hispanic was 4.33 ( $s.d. = .464$ ), MultiRacial was 3.70 ( $s.d. = .791$ ), and Rather not Say was 4.01 ( $s.d. = .579$ ).

Also, after assuming homogeneity of variance, computer self-efficacy scores between varying education levels at the start of the CSC 1113 course were not significantly different [ $F(3, 452) = .413, p = .744$ ]. The mean pre-CSE scores for those

students with a G.E.D were 4.10 ( $s.d.=.921$ ), for those with a High school degree were 3.95 ( $s.d.=.681$ ), for those with an Associate's were 3.95 ( $SD=1.187$ ), and for those with a Certificate were 3.94 ( $SD=.773$ ). When comparing pre-CSE scores among varying education levels focusing on G.E.D., High School graduates, Certificate, Associate's the largest group was High School graduates ( $n = 408$ ).

*Research Question 1b.* For Research Question 1b, "Is there a difference in demographics (gender, race, education) in skills assessment scores prior to taking the CSC 1113 course" a one-way ANOVA statistical analysis was conducted. Similar to Research Question 1a, the independent variables for this research question were the demographic variables. The dependent variables were the scores on the skill assessments prior to taking the CSC 1113 course, which were continuous. Assuming homogeneity of variance, pre-test skill assessment scores in the areas of Windows, Word, Excel, and PowerPoint prior to taking the CSC 1113 course were not significantly different between men and women. However, pre-course skills in the area of Technology were significantly lower for women ( $M = 60.52, s.d. = 14.47$ ) than for men ( $M = 66.40, s.d. = 16.04$ ) ( $F [1,455] = 16.72, p < .001$ ).

Similarly, to assess whether there was a difference in skill assessment scores between racial groups prior to taking the CSC 1113 course, a one-way ANOVA statistical analysis was conducted. Hispanic and Latino groups were combined for the post hoc statistical analysis since only one participant identified with being from the Latino race. Assuming homogeneity of variance, pre-test skill assessment scores in the area of PowerPoint prior to taking the CSC 1113 course was not significantly different between racial groups [ $F (5, 451) = 2.08, p = .067$ ]. However, the one-way ANOVA revealed that



there were significant differences between racial groups for the following pre-course skill assessment scores: Technology [ $F(5, 451) = 9.58, p < .001$ ], Windows [ $F(5, 451) = 10.59, p < .001$ ], Word [ $F(5, 451) = 15.09, p < .001$ ], and Excel [ $F(5, 451) = 4.30, p = .001$ ] (see Table 3). Hence, post-hoc analyses were needed in order to investigate where the racial group differences occurred. Because the sample sizes between racial groups were severely unequal, the Games-Howell post hoc method was the most appropriate for this study to reduce the chance of Type I error when sample sizes are smaller than 6 (Newsom, 2006).

Table 3

*Demographic effect (Race) on Skills prior to taking the course CSC 1113*

		Sum of				
Computer Skills	Source	Squares	df	Mean Square	f	Sig.
Technology Skills	Between Groups	12110.836	5	2422.167	11.379	<.001
	Within Groups	96001.199	451	212.863		
	Total	108112.035	456			
Windows/OS	Between Groups	16956.913	5	3391.383	12.564	<.001
	Within Groups	121734.511	451	269.921		
	Total	138691.423	456			
Word Processing	Between Groups	23742.945	5	4748.589	18.037	<.001
	Within Groups	118733.404	451	263.267		
	Total	142476.349	456			
Spreadsheets	Between Groups	7421.804	5	1484.361	4.209	.001
	Within Groups	159067.473	451	352.699		
	Total	166489.278	456			
Presentation Software	Between Groups	2964.086	5	592.817	2.080	.067
	Within Groups	128510.882	451	284.947		
	Total	131474.968	456			

Post-hoc analyses were conducted; various skills were identified as being statistically different between multiple racial groups. For instance, African Americans and "Rather not says" had significantly different scores, with "Rather not says" having a significantly higher Technology Skills score on the pre-test skills assessment ( $M=57.57$ ,  $s.d.=13.52$ ). In the area of Windows skills on the pre-test skills assessment, African Americans and Caucasians had significantly different scores, with Caucasians having a significantly higher Windows pre-test score ( $M=53.34$ ,  $s.d.=15.87$ ). On the pre-test skills assessment in the area of Word skills, African Americans scored significantly lower than Asians, Caucasians, Hispanics, and the "Rather not say" groups. Additionally, Asians and Caucasians had significantly different scores, with Caucasians having a significantly higher Word skills pre-test score ( $M=55.19$ ,  $s.d.=17.80$ ). Lastly, Caucasians scored significantly higher on the pre-test assessing Excel skills than African Americans ( $M=36.07$ ,  $s.d.=16.08$ ).

Finally, a one-way ANOVA was conducted in order to investigate whether there was a significant difference in pre-test skills assessment scores between students with various levels of education. Assuming homogeneity of variance, pre-test skill assessment scores in the areas of Technology Skills, Windows, Word, Excel, and PowerPoint prior to taking the CSC 1113 course were not significantly different between levels of education.

### *Research Question 2*

Research question number 2 examined whether taking computer courses prior to CSC 1113 effected participants' self-efficacy. To examine Research Question 2 "Does the number of computer courses taken in high school correlate to the computer self-efficacy prior to taking the CSC 1113 course" a bivariate correlation was used. The first

variable used in this correlation was the number of courses a student took while in high school, which was a continuous variable. The second variable used in this correlation was the computer self-efficacy score prior to taking the CSC 1113 course, which was also a continuous variable. The analysis revealed a weak to moderate correlation in the number of computer courses students completed in high school. The correlation between the number of computer courses taken in high school were significantly and positively related to the computer self-efficacy scores prior to taking the CSC 1113 course (Pearson  $r(457) = .126, p = .007$ ).

### *Research Question 3*

Research question number 3 had been divided into two sub-questions. The questions examined whether scores from both surveys, (name them), increased after taking CSC 1113.

*Research Question 3a.* To address Research Question 3a, “Do pre- and post-CSE scores differ as a result of taking the CSC 1113 course,” a Repeated Measures ANOVA with two levels was used. The independent variable of time had two levels, pre-course and post-course. The dependent variable was the mean score of the computer self-efficacy instrument. Using Mauchly's Test of Sphericity, the CSE score prior to taking the CSC 1113 course was significantly lower than after students completed the course ( $F(1, 366) = 299.900, p < .001$ ). The mean scores on the CSE prior to taking the CSC 1113 course was 3.94 (s.d.= .685) and the mean score on the CSE after completing the CSC 1113 course was 4.45 (s.d. = .509).

*Research Question 3b.* Similarly, to address Research Question 3b, “Do pre- and post-skills assessment test scores differ as a result of taking the CSC 1113 course,” a

Repeated Measures ANOVA statistical analysis with two levels was used. Again, the repeated measure of time had two levels: pre-course and post-course. The dependent variables were the mean scores for each of the five skills assessments. The score on the Technology Skills assessment prior to taking the CSC 1113 course was not significantly different than after students completed the course [ $F(1, 366) = 3.067, p = .081$ ]. The mean scores on the Technology skills prior to taking the CSC 1113 course was 62.99 ( $s.d. = 15.55$ ) and the mean score on the Technology skills after completing the CSC 1113 course was 64.46 ( $s.d. = 16.60$ ).

On the other hand, the score on the other four skill assessments were statistically significant when comparing pre- and post-course skills assessments. For instance, the Windows pre-test score prior to taking the CSC 1113 course was 59.52 ( $s.d. = 17.48$ ) was significantly lower than after students completed the course 64.01 ( $s.d. = 19.97$ ) [ $F(1, 366) = 23.92, p < .001$ ]. Word scores reflected statistically significant differences between pre-test skills assessment ( $M = 63.32, s.d. = 17.71$ ) and post-test skills assessment ( $M = 68.71, s.d. = 18.78$ ) showing the following results [ $F(1, 366) = 34.56, p < .001$ ]. Excel reflected statistically significant results between pre-test skills assessment ( $M = 40.33, s.d. = 19.16$ ) and post-test skills assessment ( $M = 67.16, s.d. = 20.92$ ) showing the following results [ $F(1, 366) = 538.34, p < .001$ ]. Additionally, PowerPoint results were also statistically significantly different between pre-test skills assessment ( $M = 45.17, s.d. = 16.78$ ) and post-test skills assessment ( $M = 56.03, s.d. = 18.78$ ) showing the following results [ $F(1, 366) = 93.21, p < .001$ ].

## Summary

Chapter IV included the results of the statistical analyses that addressed the research questions of this dissertation. The results of the study indicate that there was not a difference in CSE among various demographic groups at the beginning of the course. In regards to skill level among the demographic groups at the beginning of the course, findings showed that there was no significant difference in skill level among men and women except in the area of technology in which women scored lower. However, the one-way ANOVA revealed that there were significant differences between racial groups in the skill level at the beginning of the course with the exception of PowerPoint. When comparing levels of education there was no significant difference in skills assessment scores between students with various levels of education at the beginning of the course. Research analysis revealed that the correlation in the number of computer courses students completed in high school were significantly related and positively related to the CSE scores prior to taking the CSC 1113 course. Findings showed Computer Self-efficacy increased as a result of taking the course CSC 1113. Computer skills also increased in all of the areas with the exception of computer hardware/technology.

Chapter V includes a discussion of the findings, possible limitations, and recommendations for additional study.

## CHAPTER V

### DISCUSSION

The majority of college students today cannot remember a time when nearly every household had a computer connected to the Internet or virtually every person could be found with a cell phone nearby. The perception from college administrators and society is that these students have the computer/technological skills needed to be successful in college courses. However, research consistently shows that exposure to computers/technology does not translate to these value added skills. Because of these perceptions from college administrators and faculty, colleges have been discontinuing the requirement of a foundational computer literacy course from the required graduation requirements at alarming rates.

The purpose of this quantitative research study was to determine whether the course CSC 1113, a foundation level computer literacy course, still adds value as a requirement in the academic core curriculum. Findings from this study are needed to show the necessity for a having a technology placement test in place and support for keeping CSC 1113 as a required course for graduation. A procedural or curricular change is needed to determine which students possess these critical skills and which do not. Students entering college without these skills would have a course in place to give them the instruction needed; students already possessing the skills could avoid the course altogether. Results from the can study also show the value and benefit of the course CSC 1113 to the students.

The two learning theories that guided this study are Bandura's theories of *computer self-efficacy* and *self-efficacy*. Findings from this study examined students' Computer Self-efficacy and examined if CSE was a reliable indicator of determining computer skills.

A trend of college advisors on the campus where the study was conducted is to rely on computer self-efficacy for placement of students in upper level computer classes. Results from this study show computer self-efficacy is not a reliable indicator for placement of students in computer classes. An assessment is needed to ensure that students obtain the computer instruction necessary to be successful in future courses and careers

#### Demographic Findings

Participant information gathered in the pre-course survey packet revealed the bulk of the students owned a smart phone and had a computer in the home connected to the Internet other than a phone. Responses indicated that 69.4% ( $n = 344$ ) of those surveyed were required to take a computer course to graduate from high school. Findings revealed that computer courses were available as an elective class in 67.3% ( $n = 334$ ) of the respondents' high schools. Caucasians ( $n = 217$ ) and African Americans ( $n = 214$ ) were the two largest racial groups surveyed. All participants were 18 years of age or older with the largest education group being high school graduates ( $n = 408$ ) and the majority of participants ( $n = 408$ ) described *recently graduated high school and pursuing a college degree* as their situation. Females made up the largest percentage (54%) of the population and 38% being male.



## Research Findings

The following describes the research findings of this dissertation study along with studies that offer a comparison or contrast to the study's results.

### *Research Question 1a*

Research Question 1a: "Is there a difference in demographics (gender, race, education) regarding computer self-efficacy prior to taking the CSC 1113 course?" Findings obtained through statistical analyses to address Research Question 1a suggest that Computer Self-efficacy between gender, race, and education was not significantly different at the start of the course CSC 1113.

Research has shown that computer self-efficacy has had a direct influence on classroom performance (Hauser et al., 2012). A number of factors have been researched concerning computer self-efficacy and how self-efficacy affects outcomes. These include previous success, support and encouragement from the instructor, acquired skills, demographics (gender, age, experience), and intrinsic beliefs (apprehension/self-confidence) (Hauser et al., 2012; Sun & Rueda, 2012).

Gender differences have consistently shown up in research of variables affecting attitudes towards computers. Males have been shown to use computers much more than females, and males have a tendency to show much more interest than females. Females have a tendency to become more stressed when using computers. The gender biases have been well documented in numerous countries, and they have been documented across all educational groups spanning from pre-school to college age. However, on a positive note, gender differences seem to be slowly dissipating (Gibbs, 2013). Findings in this dissertation study found that men and women showed no difference at the beginning of

the course in computer self-efficacy and agreed with Gibbs (2013) findings. The sample size of this study was large with males making up 38.1% and females making up 54% of the population ( $n = 367$ ).

Lack of difference in Computer Self-efficacy where minorities are concerned is in line with Messineo and DeOllos (2005) findings. However, in their particular research study the majority of the participants were Caucasian, over 80%, and only 7% being African American. Findings in this dissertation study revealed much more balanced racial groups contributing to much more reliable research findings. The statistical findings from this research study resulted in no significant racial differences in computer self-efficacy. In this dissertation study there was an even distribution of Caucasians ( $n = 217$ ) and African Americans ( $n = 214$ ) which has a significant research contribution in determining differences in computer self-efficacy at the beginning of the course between racial groups.

The researcher was not able to find any research pertaining to how education level of entering freshman regarding computer self-efficacy was affected. The largest groups of participants in this dissertation study however, were high school graduates and students who described their situation as recently graduating from high school and pursuing a degree. Therefore, the researcher can safely report the largest percentage, approximately 70.4% ( $n = 349$ ), of the population was 18-19 years of age. The research findings from this study support the lack of difference in computer self-efficacy among education level because the overwhelming majority of surveyed participants were likely under 21 years

of age. Past research shows computer self-efficacy is much lower in non-traditional students, and how greater of one's age can negatively affect computer self-efficacy (Brown, 2008; Cooper-Gaiter, 2015; Gibbs 2013).

### *Research Question 1b*

Research Question 1b: "Is there a difference in demographics (gender, race, education) in skills assessment scores prior to taking the CSC 1113 course?" Findings for research question 1b showed that the knowledge of males and females prior to taking the course CSC 1113 in the areas of Windows, Word, Excel, and PowerPoint were not significantly different. However, pre-course skills in the area of technology were significantly lower in women. The findings of this study were consistent with Goode (2010) who showed that low-income students and females came up short in terms of technology skills. Goode's research showed disparities in technological skills where economic class, race, and gender were concerned.

Findings for research question 1b in the area of race revealed that pre-test skills in the area of PowerPoint were not different among the various racial groups. However, statistical findings did reveal significant differences between racial groups in the areas of technology, Windows, Word, and Excel. The group "Rather not say" showed significantly higher technology skills than the African American group. Caucasians showed higher Windows skills than African Americans. African Americans demonstrated significantly less skills in the area of Word than Asians, Caucasians, Hispanics, and "Rather not say" groups. In the area of Word, Caucasians showed an increase in knowledge over the Asian demographic. Lastly, statistical analysis showed Caucasians had significantly higher skills than African Americans in Word.

The findings of Messineo and DeOllos (2005) were that minority respondents were lower in skills-based areas of computers as compared to Caucasians. However, minorities had comparable computer self-efficacy to the Caucasian group. These research findings were also similar to Wilkinson's (2006) findings showing minorities pre- and post-test scores were lower on all the skills-based tests with the exception of Access. However, the minority group had greater improvements of scores among every exam with the exception of Excel. This research study findings revealed that minorities scored lower on all skill levels with the exception of PowerPoint. PowerPoint is the last unit covered during the semester; therefore, students may be most familiar with these skills.

Statistical results for research question 1b to investigate whether there was a difference between demographics in the area of education revealed there was not a significant difference in pre-test skill level in the areas of Technology Skills, Windows, Word, Excel, and PowerPoint prior to taking the course CSC 1113. The researcher had difficulty finding other studies that examined education levels to compare and analyze these findings to, so it was difficult to conclude whether these findings were consistent with other studies.

#### *Research Question 2*

Research Question 2: "Does the number of computer courses taken in high school correlate to the computer self-efficacy prior to taking the CSC 1113 course?" Findings obtained through statistical analyses to address Research Question 2 showed a positive correlation between the numbers of computer courses students take in high school to their computer self-efficacy at the start of the course CSC 1113. This supported Karsten and Roth's (1998b) study showing a high correlation in computer self-efficacy among

students who had prior computer experience in pre-test scores. These findings were also consistent with Havelka's (2003) findings who reported a link between computer self-efficacy and the number of computer courses a student takes in high school. Havelka discovered significant differences in cases where students had completed three or more computer courses than individuals who reported taking only one or two. Grant et al. (2009) also showed that self-efficacy was reflective of an individual's past performance and experiences, and this influenced future intentions towards a task. Many researchers have also found that training and experience in computer technology can have significant impact on students' computer self-efficacy (Sun & Rueda, 2012). Research shows the more high schools computer classes a student has had and the more computer experiences a student has the higher one's computer self-efficacy (Heflin, 2015; Morris, 2010).

### *Research Question 3a*

Research Question 3a: "Do pre- and post-CSE scores differ as a result of taking the CSC 1113 course?" Findings obtained through statistical analyses to address Research Question 3a suggest that Computer Self-efficacy between gender, race, and education was significantly lower at the start of the course CSC 1113 than after completion of the course. These findings supported Karsten and Roth's (1998b) study showing all students regardless of prior computer experience or lack thereof, showed a significant increase in computer self-efficacy because of taking an undergraduate introductory computer class. These findings also supported Wilkinson's (2006) study reporting minorities' perceptions of computer knowledge were not significantly different from the Caucasian group. Research consistently shows that computer experience

positively affects computer self-efficacy rates (Grant et al., 2009; Havelka, 2003; Karsten & Roth 1998b; Sun & Rueda, 2012).

### *Research Question 3b*

Research Question 3b: “Do pre- and post-skills assessment test scores differ as a result of taking the CSC 1113 course?” Findings obtained through statistical analyses showed no significant difference in Technology Skills assessment scores prior to taking the CSC 1113 course and after the course was completed. However, the scores in the other four areas (Windows, Word, Excel, and PowerPoint) were all statistically significant when comparing pre- and post- skills assessment scores.

These findings support Uraski’s (2009) research who evaluated incoming students’ basic level of computer literacy. Results from the study showed positive gains in the post-course survey because of the class and six weeks later, there appeared to be no loss of skills. Findings from the statistical research also supported Wilkinson’s (2006) findings where post-test scores reported significant improvement after instruction was received with mean scores above 70% with scores highest in PowerPoint and Word. These findings were also similar to VanLengen’s (2007) study where introductory computer systems students were given a pre-test at the beginning of the semester and a post-test at the semester’s conclusion. Significant gains were reported on the post-test when compared to the pre-test showing a significant increase in computer conceptual knowledge because of students completing the introductory computer course. A similar study conducted by Shannon (2007) revealed that there was a significant difference within ethnicity before and after the introductory computer courses reporting significant

increased levels of computer/technology literacy on all levels. None of these research studies show that entering college freshman have the skills needed to be successful in college courses.

### Discussion of Findings

The two largest populations of this dissertation study were Caucasians ( $n = 217$ ) and African Americans ( $n = 214$ ). Because of these populations being even in distribution, the findings of this study are relevant of college freshman populations both at community colleges and at the university. Any college or university considering dropping the computer literacy component from the academic core or those institutions that have already discontinued the computer literacy requirement should look at the computer skills of students at the beginning of the semester presented in this dissertation and reconsider. Colleges and universities should also evaluate how students are placed in foundational computer courses and more advanced computer courses, because computer self-efficacy is not a reliable indicator for placement based on the findings in this study.

Colleges and universities should consider computer skills are not simply about students taking a foundational computer course. Academic core is designed to provide graduates with a well-rounded education. Based on the findings of this dissertation study a foundational computer course should still be included as a requirement because students are not entering college with these much-needed skills. Students that can show proficiency in these skills should be able to take a placement test to bypass the computer requirement and focus on other courses in pursuit of a degree. Computer skills have a trickle-down effect into other courses. College instructors and professors expect students

to have these valuable and much needed skills. They also assume students already have these skills when making assignments in classes.

Based on the findings in this dissertation study it is evident that students are not coming to college with these needed computer application skills that transfer into these other courses. It is essential colleges and universities need to make this consideration when discontinuing computer requirements from the academic core. Students without these skills are going to be at a disadvantage when pursuing their college degree.

Academic core should provide a well-rounded educational experience and when colleges and universities do not include a critical skill such as computer skills in these requirements, we are providing our students a disservice. Students are going to need computer skills to not only complete their degree and be successful in college classes, but they will need these skills for future jobs.

#### Limitations

The following were identified as limitations for this research study:

1. Hispanic and Asian racial groups were a very small part of the sample. Results of study were reflective of only African Americans and Caucasian populations.
2. Questions were objective in nature rather than task-oriented. Students may be able to figure out a task by doing it on the computer and this is much easier than discussing terminology.
3. The study did not ask students what their specific ages were or if students were traditional versus non-traditional students. This made pin pointing differences in CSE and skill level more difficult.



4. The study also did not include household income levels on the demographic questionnaire or inquire whether the students received financial aid. Lack of this information made distinguishing gaps in the skills-based assessment more difficult.

### Implications

The researcher's intent was to create an increased awareness and understanding of the lack of computer skills of community college freshman. Because students have grown up in an age of computers and technology, the perceptions by college administrators are they already have the knowledge in this area and possess the necessary computer skills needed to succeed in pursuing a college degree. Despite the limitations, this dissertation study revealed interesting findings regarding community college students' computer self-efficacy and computer skills. Findings revealed that the course CSC 1113 offers value to students' education as a required course. Data revealed computer self-efficacy is not a reliable indicator for placement of students into a required CSC 1113 course. By changing placement procedures of computer courses and not relying on students' CSE as a gauge for placement, this would help instructors across the curriculum by having students better prepared with the technology skills needed for their classroom.

Because of the populations of Caucasians and African Americans, being an even distribution the findings of this dissertation has the ability to provide valuable insight to colleges and universities considering discontinuing the computer literacy course from the graduation requirements. Findings from this study show college freshmen are not entering college with these skills. Results of the study also have the ability to show college administrators that CSE should not be a gauge for placement and advising rules

should be changed at these institutions to not rely on CSE for placement. Colleges should consider a placement test in the area of computer literacy to assess which students have these skills and those who do not. If students do not enter college with these skills colleges should require them to take a foundational computer course.

Instructors and professors teaching at institutions that do not require a computer literacy course as a degree requirement should consider the findings of this dissertation study when making assignments in their classes. Teachers should consider that the majority of these students do not have these computer application skills and may struggle to complete these types of assignments.

Despite students growing up in a digital age students still do not have the critical computer skills colleges require for students to be successful in the pursuit of a college degree. Findings from the study revealed in dissertation studies such as these should be considered before administrators make drastic decisions to discontinue courses such as these from the core curriculum.

#### Recommendations for Future Research

This dissertation study expands the view that computer self-efficacy in college freshman is not a reliable indicator of actual skills. Research indicates that students' computer self-efficacy is much greater than actual knowledge.

1. This study revealed that taking a foundation computer course increased both computer self-efficacy and computer skills. Future research could evaluate CSE and computer skills of those who test out of the introductory computer classes to those who take the foundational computer course.

2. Findings from the study showed there was no significant difference in CSE among racial groups at the completion of the course however; there was a significant difference in skill level. Future research is needed to determine why computer skills were different after completion of the course among racial groups.
3. The large majority of participants indicated they had computer courses in high school and had a computer in the home connected to the Internet. However, there is great disparity of skill level among racial groups. Future research could explore what type of technology exposure students had in high school based on geographical locations (e.g., rural, urban), and whether students have grown up with a computer in the home. This may help determine what kind of equipment students have been exposed to prior to enrolling in college.
4. Income level was not included in the demographic questionnaire. Future research could analyze whether income level and those students who receive financial aid show a difference in computer self-efficacy and computer skills.
5. At the time of data collection, online training software, **Student Assessment Module (SAM)**, did not offer a free trial to students. This prevented the researcher from administering a lab- based test for data collection. SAM now has a 21-day free trail and a pre- and post-skills test can be administered for data collection. Future research could explore whether a task-based instrument rather than an objective-based instrument could make a difference on the skills-based knowledge portion of the data collection.

## Summary

According to the findings of this study, foundational computer courses still provide much needed value to the community college curriculum. Despite students growing up in the technological age, the large majority still do not have the computer/technology skills sought after by instructors for students to be successful in college coursework. Findings from this study also show computer self-efficacy is not a reliable indicator for placement in more advanced computer courses. Thus, there needs to be a placement test instituted to serve as a screening mechanism to determine whether students have the computer skills to warrant bypassing CSC 1113.

Chapter V included a discussion of the findings of this research study, including the research questions. The researcher's conclusions were provided, along with comparisons of current findings to previous research studies. Limitations and implications of the study plus recommendations for future research were presented.

## APPENDIX A

### STANDARD COURSE SYLLABUS COMPUTER CONCEPTS, CSC 1113

**COURSE TITLE:** Computer Concepts, CSC 1113

**COURSE DESCRIPTION:** (3 hours credit). A computer competency course which introduces concepts, terminology, operating systems, electronic communications, and applications. Concepts are demonstrated and supplemented by hands-on computer use. Three hours lecture/lab.

**COURSE GOALS:**

This course will provide instruction in basic concepts and terminology related to computer hardware and operating systems and will include instruction and practice using Microsoft Windows, Word, Excel, PowerPoint, and the Internet.

**OUTCOME COMPETENCIES:**

Students will:

- Correctly answer 2 out of 3 (66%) questions related to Internet Concepts on Final Competency Test.
- Correctly answer 1 out of 2 (50%) questions related to General Application Software Techniques Final Competency Test.
- Correctly answer 2 out of 3 (66%) questions related to Spreadsheet Concepts and Techniques Final Competency Test.
- Correctly answer 1 out of 2 (50%) questions related to Operating System Concepts and Techniques Final Competency Test.

**COURSE REQUIREMENTS:**

1. Students must meet the requirements of the NWCC attendance policy.
2. Students must have a final average that is passing as defined by the grading scale listed in the Instructor's Course Outline.

**METHODS OF INSTRUCTION:**

The methods of instruction used for this course may include any or all of the following:

1. Classroom lecture
2. Audio/visual presentation (overhead, PowerPoint, video, etc.)
3. Homework assignments
4. Laboratory exercises
5. Class demonstrations

### **EVALUATION TOOLS:**

Evaluation tools used for this course may include any or all of the following:

1. Unit Tests
2. Open Book Tests
3. Lab assignments
4. Lab Quizzes

### **REQUIRED TEXTBOOKS:**

*Students should refer to Instructor's Course Outline for the specific textbook(s) to purchase—see page 4.*

### **REQUIRED EQUIPMENT/MATERIALS/SUPPLIES:**

*Students should refer to Instructor's Course Outline for the specific equipment/materials/supplies to purchase—see page 4.*

### **GRADING POLICY:**

NWCC does not have a standard grading scale for all classes. Students should refer to the Instructor's Course Outline for the specific grading scale used for this class.

### **NWCC'S OFFICIAL ATTENDANCE POLICY:**

**ABSENCES:** Regular and punctual attendance at all scheduled classes is required of all students and is regarded as essential to course credit. Regardless of the nature of the absence, students must attend a minimum of 90% of all scheduled classes to be eligible to receive credit for the course or in other words a student can't miss two weeks of class. If a student's absences exceed 10% of the scheduled class meetings, that student will be automatically withdrawn from the class with a grade of F. For a class meeting three times a week, 7 absences is over 10%. In other words, on the seventh absence, you are automatically withdrawn from the class with a grade of F. So you can miss 6 times without being given an F. For a class meeting two times a week, 5 absences is over 10%. In other words, on the fifth absence, you are automatically withdrawn from the class with a grade of F. So you can miss 4 times without being given an F. A student who has been reported as having excessive absences has the right to appeal. For more information about the appeal process, contact the Center Dean or the Academic Dean.

**TARDIES:** Students are expected to be prompt in class attendance. If students miss more than 10 minutes of a class meeting, they will be marked absent for that meeting. Three tardies will count as one absence.

**OFFICIAL ABSENCES:** Official absences are absences caused by a student representing the College for an approved function. These absences will not count toward the student's total absences.

**ATTENDANCE POLICY FOR ONLINE CLASSES:** For specific information regarding the attendance policy for online classes, see the Course Outline on page 4.

**PLAGIARISM AND CHEATING/ACADEMIC HONESTY:**

Both cheating and plagiarism are prohibited. Plagiarism is the presentation of another person's ideas, words, or work as one's own. Alleged violations involving cheating, plagiarism, and other academic misconduct will be handled according to the procedures outlined in the NWCC Student Guide. These procedures are as follows: Students involved in cheating or plagiarizing will be reported to a five-member Ad Hoc Committee on Cheating and Plagiarism. The chairman of this committee will be the Academic or Career-Technical Dean as determined by the student's major. Other committee members will be the division director/chairman of the department in which the alleged dishonesty occurred, the student's faculty advisor, and two SGA members. The committee will review the alleged act and may assign sanctions ranging from imposing a failing grade in the course to withdrawal from the College.

**STATEMENT OF AUTHORITY:**

The instructor reserves the right to remove from the classroom any student whose conduct is disruptive to the learning process. See Classroom Code of Conduct Handout for additional explanation.

**ADA STATEMENT:**

Students with disabilities are encouraged to notify their instructors of their condition at the beginning of the semester. The college and your instructors will make reasonable accommodations for persons with documented disabilities.

**EMERGENCY PROCEDURES FOR ON-SITE COURSES:**

1. In case of fire, the tone "Street Thunder" will sound from the Multi-Sound Megaphone. Upon receipt of a fire alert, evacuate the building in a calm, orderly manner. This class will exit through the west door. Do not linger around the exits. You might block the fire vehicles.
2. The campus tornado siren will sound when a tornado warning is issued. When you hear the siren, this class will enter the men's restroom or the suite of offices (whichever one has the most room). Take cover by getting under a sturdy object or by facing an interior wall and kneeling with your hands over your head. Keep calm and quiet so that you can hear necessary instructions.
3. No warning will be given for an earthquake. If one occurs, take cover by getting under a desk or other sturdy object. Do not run out of the building. Do not light matches. Do not turn lights on or off.

## APPENDIX B

### INSTITUTIONAL REVIEW BOARD NOTICE OF COMMITTEE ACTION



**INSTITUTIONAL REVIEW BOARD**  
118 College Drive #5147 | Hattiesburg, MS 39406-0001  
Phone: 601.266.5997 | Fax: 601.266.4377 | [www.usm.edu/research/institutional.review.board](http://www.usm.edu/research/institutional.review.board)

#### NOTICE OF COMMITTEE ACTION

The project has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

- The risks to subjects are minimized.
- The risks to subjects are reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the "Adverse Effect Report Form".
- If approved, the maximum period of approval is limited to twelve months.  
Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: 15010603  
PROJECT TITLE: An Assessment Comparing Community College Students' Computer Self-Efficacy and Task Based Computer Skills  
PROJECT TYPE: New Project  
RESEARCHER(S): Amy N. Stewart  
COLLEGE/DIVISION: College of Education and Psychology  
DEPARTMENT: Curriculum, Instruction and Special Education  
FUNDING AGENCY/SPONSOR: N/A  
IRB COMMITTEE ACTION: Expedited Review Approval  
PERIOD OF APPROVAL: 01/14/2015 to 01/13/2016  
**Lawrence A. Hosman, Ph.D.**  
**Institutional Review Board**



## APPENDIX C

### NWCC'S PERMISSION TO CONDUCT RESEARCH ON CAMPUS

**Amy Stewart**

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**From:** Carolyn Warren  
**Sent:** Thursday, January 15, 2015 3:57 PM  
**To:** Amy Stewart; Leah Arrington; Richie Lawson  
**Cc:** Matthew Domas  
**Subject:** RE: Request for Approval Concerning Dissertation Data Collection

Amy,

You are now approved to conduct this research. Good Luck!

Carolyn Warren  
Director of Institutional Research and Effectiveness  
Northwest Mississippi Community College  
4975 Highway 51 North  
Senatobia, MS 38668  
Office: 662.562.3927  
Fax: 662.560.5242

## APPENDIX D

### PERMISSION FROM DR. MURPHY TO USE CSE SCALE IN THE STUDY

**Amy Stewart**

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**From:** Murphy, Christine (DPH) <christine.murphy@state.ma.us>  
**Sent:** Thursday, October 16, 2014 9:04 AM  
**To:** Amy Stewart  
**Subject:** RE: Computer Self Efficacy

Hi Amy...I am indeed that Christine Murphy. You have my permission to use the Computer Self Efficacy Scale. My only request is that you send me a summary of your results and any reliability or validity information you obtain for your sample. Good luck with your dissertation!

Best regards...Chris

Christine A. Murphy PhD RN  
Program Manager  
National Sexual Assault TeleNursing Center  
517.680.1446 (Blackberry)  
517.243.5147 (Fax)  
[christine.murphy@state.ma.us](mailto:christine.murphy@state.ma.us)  
[www.mass.gov/dph/telegenursing](http://www.mass.gov/dph/telegenursing)



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**From:** Amy Stewart [mailto:[astewart@northwestms.edu](mailto:astewart@northwestms.edu)]  
**Sent:** Thursday, October 16, 2014 9:55 AM  
**To:** Murphy, Christine (DPH)  
**Subject:** Computer Self Efficacy

Dr. Murphy,

I found your contact information online and I was wondering if you are the C.A. Murphy that assisted in the development of the CSE scale in 1989? Currently I am a student at The University of Southern Mississippi in Hattiesburg, MS. I am currently working on my dissertation and I am trying to obtain permission to use this Computer Self Efficacy scale for the research portion of my study. If you are the same Dr. Murphy would you grant me permission to use the scale? The scale would be used solely for the purpose of my dissertation and nothing else.

Thank you so much and I look forward to hearing back from you.

*Amy Stewart*  
Business Instructor  
Northwest Mississippi Community College  
4975 Highway 51 North  
Senatobia, MS 38668  
(662) 562-3304 **Phone**

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APPENDIX E  
SURVEY LETTER

January 2015

Dear Student,

This dissertation research study is being conducted to examine the relationship between students' confidence in their ability to complete certain operations on the computer and what students actually know about computers. This research is being conducted with the aim of someday having a test out option available to you as a means of bypassing the course CSC 1113, *Computer Concepts*. Your participation will provide valuable information in helping this goal to become fulfilled for future students.

The enclosed survey asks for your perceptions regarding the level of confidence you have in completing certain tasks on the computer and includes some demographic information. The survey then goes on to ask you to answer specific objective questions about computers and how they work. Another questionnaire identical to this one will be given to you at the end of the semester to compare knowledge that you gained throughout the course, and if the confidence in your ability to complete certain tasks on the computer has changed. Your participation is voluntary, and there is no penalty for not participating. If you do not wish to complete the survey once you have started, feel free to stop and return the survey instrument at the door before you leave. The survey should take about 30 to 45 minutes to complete.

All data collected will be treated as group data, and no names of individuals or institutions will be used. Please be assured that all data collected will remain completely confidential. The survey instrument is coded to assist in the researcher matching the survey instrument given at the beginning of the semester to the survey instrument given at the end of the semester.

Completion and return of the survey indicates your willingness to participate in the study. Should you have any questions please feel free to contact myself or the teacher administering the questionnaire at the back of the room.

Let me extend a sincere thank you in advance for your willingness to assist me in this very important research project.

Kind regards,

Amy N. Stewart  
P.O. Box 870  
Hernando, MS 38632  
662-562-3304  
amy.payne@usm.eagles.edu

## APPENDIX F

### DEMOGRAPHIC INSTRUMENT

The student is responsible for choosing to participate in this study. Agreement to participate is given by voluntarily participating in this survey. A printed copy of the Participant Information Letter was given to you in the survey packet. Grades will not be affected by participation/non-participation in this study.

**Please give your student ID \_\_\_\_\_**

Demographic Information. Please circle best answer.

1. What is your gender?
  - a. Male
  - b. Female
2. Please indicate your ethnic background:
  - a. African American
  - b. Arab
  - c. Asian/Pacific Islander
  - d. Caucasian/White
  - e. Hispanic
  - f. Latino
  - g. Multi-racial
  - h. Would prefer not to say
3. What is your highest degree completed?
  - a. G.E.D.
  - b. High School Diploma
  - c. Certificate
  - d. Associates
4. Which of the following best describes your situation?
  - a. I recently graduated from high school and I am pursuing my college degree
  - b. I recently earned my G.E.D. and I am pursuing my college degree
  - c. I have been in the workforce for several years and I am returning to school
  - d. I am taking the class for fun to learn something new
  - e. None of these apply

5. Were you required to take a computer course in High School?
  - a. Yes
  - b. No
  - c. Don't know
6. Were computer courses offered as elective classes at your high school?
  - a. Yes
  - b. No
  - c. Don't know
7. How many computer classes did YOU take in High School?
  - a. 0
  - b. 1
  - c. 2
  - d. 3
  - e. More than 3
8. On average, how much of your day is spent on the computer for academic or personal reasons?
  - a. 0-2 hrs
  - b. 3-4 hrs.
  - c. 5-6 hrs.
  - d. 7-8 hrs
  - e. 9-10 hrs
  - f. >10 hrs.
9. Do you have a personal smart phone connected to the Internet?
  - a. Yes
  - b. No
  - c. Don't know
10. Do you have a computer in your home connected to the Internet other than a cellphone?
  - a. Yes
  - b. No
  - c. Don't know

## APPENDIX G

### CSE SCALE

Computer Self-Efficacy Scale (Murphy, Coover & Owen, 1988)

Five-Point Likert-type Scale: 1 = Strongly Disagree, 5 = Strongly Agree

1. I feel confident entering and saving data (words and numbers) into a file.
2. I feel confident opening up a data file to view on a monitor screen.\*\*
3. I feel confident installing software correctly.\*\*
4. I feel confident handling a disc correctly.\*\*
5. I feel confident escaping/exiting from a program or software.
6. I feel confident making selections from an on-screen menu.
7. I feel confident copying an individual file.
8. I feel confident using the computer to write a letter or essay.
9. I feel confident moving the cursor around the monitor screen.
10. I feel confident working on a personal computer (microcomputer).
11. I feel confident using a printer to make a "hardcopy" of my work.
12. I feel confident getting rid of files when they are no longer needed.
13. I feel confident copying a disc.
14. I feel confident adding and deleting information to and from a data file.
15. I feel confident getting software up and running.
16. I feel confident organizing and managing files.
17. I feel confident understanding terms/words relating to computer software.

18. I feel confident understanding terms/words relating to computer hardware.
19. I feel confident describing the function of computer hardware (keyboard, monitor, disk drives, processing unit).
20. I feel confident troubleshooting computer problems.
21. I feel confident explaining why a program (software) will or will not run on a given computer) I feel confident understanding the three stages of data processing: input, processing, and output.
22. I feel confident learning to use a variety of programs (software).
23. I feel confident using the computer to analyze number data.
24. I feel confident learning advanced skills within a specific program (software). feel confident using the computer to organize information.
25. I feel confident writing simple programs for the computer.
26. I feel confident using the user's guide when help is needed.
27. I feel confident getting help for problems in the computer system.
28. I feel confident logging onto a computer system.\*\*
29. I feel confident logging off a computer system.\*\*
30. I feel confident working on a computer.\*\*

\*\*Selected questions were modified to fit today's technology.

## APPENDIX H

### SKILLS BASED INSTRUMENT

**Choose the best answer for each question below:**

1. Which of the following is a correct address that will allow you access a commercial website?
  - a. www.scsite.com
  - b. www-scsite
  - c. scsite.edu
  - d. www.scsite-com
  
2. What type of software tool allows you to open and view a **Web page**?
  - a. Look up
  - b. Help
  - c. Hyperlink
  - d. Internet Explorer
  
3. When an item is underlined or in a different color and you position your mouse pointer over the item and click, you are taken to a website. This item is called a
  - a. Hyperlink
  - b. URL
  - c. Search phrase
  - d. Graphic
  
3. A(n) \_\_\_\_ is any hardware component that allows you to enter data and instructions into a computer or mobile device.
  - a. output device
  - b. communication device
  - c. input device
  - d. display
  
4. Which of the following is not an example of an output device?
  - a. scanner
  - b. printer
  - c. display
  - d. speaker
  
5. \_\_\_\_ software consists of programs designed for a specific use or purpose; and designed to help users be more productive.
  - a. System
  - b. Application
  - c. Operating System
  - d. Gaming
  
6. A(n) \_\_\_\_ drive is a storage device that consists of a flat, round, portable metal disc made of metal, plastic, and lacquer that is written and read by a laser.
  - a. hard drive
  - b. solid-state
  - c. memory card
  - d. optical disc
  
7. A one-word definition for software or a computer program is \_\_\_\_\_.
  - a. information
  - b. instructions
  - c. system
  - d. computer



8. A(n) \_\_\_\_ is a light-sensing input device that converts printed text and images into a form the computer can process.
- a. DVD
  - b. Optical drive
  - c. scanner
  - d. smartphone
9. Which of the following storage devices has the capability to hold the most information?
- a. DVD
  - b. CD
  - c. flash drive
  - d. hard disk
10. A(n) \_\_\_\_ is a collection of computers and devices connected together.
- a. network
  - b. enterprise
  - c. browser
  - d. operating system
11. You can interact with the Windows Operating System by clicking \_\_\_\_ on the screen.
- a. tiles
  - b. subsets
  - c. strategies
  - d. devices
12. Which method will allow you to open an application?
- a. Click Start button, move to All Programs, point to application and click on application name to open the application.
  - b. Right-click on desktop and select Properties
  - c. Point to Start button, click on Run
  - d. Right-click on Start button, right-click on application to launch
13. Folders primary purpose in the Windows operating systems are for \_\_\_\_.
- a. organization
  - b. programs
  - c. GUI
  - d. input
14. When a file is not stored within a folder or subfolder it is said to be stored on the \_\_\_\_ of the drive.
- a. seed
  - b. root
  - c. path
  - d. directory
15. When you delete a file from the hard drive, the deleted file is \_\_\_\_.
- a. Deleted immediately
  - b. Stored in the recycle bin
  - c. path
  - d. directory
16. A \_\_\_\_ is a private combination of characters associated with a user name.
- a. tip
  - b. password
  - c. security pass
  - d. VoIP

18. Which method is the correct sequence to duplicate (copy) text to another location in the same document?
- Select text to be copied; click Cut icon; Position insertion point to target location; click Paste icon
  - Select text to be copied; Position insertion point to target location; click Copy icon; click Paste icon
  - Select text to be copied; click Paste icon; Position insertion point to target location; click Copy icon
  - Select text to be copied; click Copy icon; Position insertion point to target location; click Paste icon
19. The Folder pane in Windows Explorer contains the \_\_\_\_\_.
- Hierarchy of folders
  - Source folder
  - Source drive
  - Contents of the highlighted folder in the Contents pane
20. A selected graphic appears surrounded by a selection rectangle, which has small squares and circles, called sizing \_\_\_\_\_, at each corner and middle location.
- arms
  - handles
  - movers
  - bars
21. The \_\_\_\_\_, or typeface, defines the appearance and shape of letters, numbers, and special characters.
- Font
  - font size
  - point
  - paragraph formatting
22. \_\_\_\_\_ text has a slanted appearance.
- Colored
  - Highlighted
  - Bolded
  - Italicized
23. Press the ENTER key in all of the following circumstances EXCEPT \_\_\_\_\_.
- to insert a blank line into the document
  - when the insertion point reaches the right margin
  - to begin a new paragraph
  - in response to prompts in Word dialog boxes
24. Headers and footers can include text and graphics, as well as the \_\_\_\_\_.
- current date
  - page number
  - current time
  - all of the above
25. Although you can use a dialog box to indent paragraphs, Word provides a quicker way through the \_\_\_\_\_.
- Quick Access Toolbar
  - Office Button Menu
  - vertical ruler
  - horizontal ruler

26. Automatic page breaks are determined by \_\_\_\_.
- a. Paper size
  - b. Margins
  - c. margin settings
  - d. all of the above
27. The Office \_\_\_\_ is a temporary storage area.
- a. Warehouse
  - b. Clipboard
  - c. Storehouse
  - d. Gallery
28. The \_\_\_\_ feature automatically corrects typing, spelling, capitalization, or grammar errors as you type them.
- a. AutoEntry
  - b. AutoCorrect
  - c. AutoAdd
  - d. AutoSpell
29. From within **Word**, which method would be used to *open a file* named **Test** on **Drive H** that has been saved in a folder named **MicroWork**? (The complete path and filename are H:\MicroWork\Test)
- a. Click the File Tab; click Open; change to disk Local Disk (H:); double-click on folder named MicroWork; double-click on the file named Test
  - b. Click the File Tab; click Open; double-click on the file named Test
  - c. Click the File Tab; click Open; click on folder named MicroWork; click on the file named Test
  - d. Click the File Tab; click Open; click on folder named MicroWork
30. \_\_\_\_ spacing is the amount of space above and below a paragraph
- a. Character
  - b. Paragraph
  - c. Page
  - d. Double
31. Word automatically numbers notes sequentially by placing a \_\_\_\_ both in the body of the document and to the left of the note text.
- a. footnote
  - b. note reference mark
  - c. tag
  - d. field
32. A(n) \_\_\_\_ paragraph is a paragraph that begins with a dot or other symbol.
- a. headline
  - b. centered
  - c. bulleted
  - d. indexed
33. To select nonadjacent items, select the first item as usual, press and hold down the \_\_\_\_ key, and then while holding down the key, select the additional items.
- a. HOME
  - b. F1
  - c. CTRL
  - d. ALT
34. The \_\_\_\_ preceding a formula alerts Excel that you are entering a formula or function and not text.
- a. quotation mark (“)
  - b. colon (:)
  - c. plus (+)
  - d. equal sign (=)

35. An Excel \_\_\_\_\_ allows data to be summarized and charted easily.
- worksheet
  - format
  - display
  - table
36. The \_\_\_\_\_ box displays the active cell reference.
- Cell
  - Worksheet
  - Formula
  - Name
37. A \_\_\_\_\_ is a series of two or more adjacent cells in a column or row or a rectangular group of cells.
- key
  - split
  - merge
  - range
38. You can enter a range in the formula bar by typing the beginning cell reference, a(n) \_\_\_\_\_, and the ending cell reference.
- dot
  - comma
  - asterisk
  - colon
39. If the following arithmetic operations all are found in a formula with no parentheses, which one is completed last?
- +
  - \*
  - /
  - ^
40. Which function in Excel would be used to average the values in cells A1 through A10?
- =(A1:A10)
  - =AVERAGE(A1:10)
  - =AVERAGE(A1:A10)
  - =AVG(A1-A10)
41. The formula in **Excel** to add the contents of cell B10 to the contents of cell C10 is
- B10 + C10
  - B10\*C10
  - =B10 + C10
  - =(B10\*C10)
42. To find the lowest value in a range from B10 through B20, use the following function:
- =MINIMUM(B10-B20)
  - MIN(B10:B20)
  - =MIN(B10:B20)
  - =(B10 – B20)
43. The \_\_\_\_\_ slide introduces the presentation to the audience.
- title
  - master
  - primary
  - content
44. All presentations should follow the \_\_\_\_\_ rule, which states the maximum number of lines and words per line that each slide should have.
- 4 x 4
  - 5 x 5
  - 6 x 6
  - 7 x 7

45. When you add a new slide, PowerPoint uses the \_\_\_\_\_ slide layout.
- a. Summary
  - b. Title and Content
  - c. New Content
  - d. Placeholder
46. Creating a lower-level paragraph is called \_\_\_\_\_.
- a. Demoting
  - b. Promoting
  - c. formatting
  - d. inserting
47. A \_\_\_\_\_ is a position within a structure, such as an outline, that indicates the magnitude of importance.
- a. level
  - b. property
  - c. theme
  - d. tag
48. As you create slides, miniature views of the individual slides are displayed in the \_\_\_\_\_ pane.
- a. notes
  - b. slide
  - c. thumbnail
  - d. images
49. The slide layouts are set up in \_\_\_\_\_ orientation, where the slide width is greater than its height.
- a. Presentation
  - b. Landscape
  - c. portrait
  - d. random
50. A PowerPoint presentation, also called a \_\_\_\_\_, can help you deliver a dynamic, professional-looking message to an audience.
- a. Preview
  - b. Gallery
  - c. slide show
  - d. demonstration

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