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A study of computer literacy skills in first-year Sinclair Community College students

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**A STUDY OF COMPUTER LITERACY SKILLS IN
FIRST-YEAR SINCLAIR COMMUNITY COLLEGE STUDENTS**

Master's Thesis

Submitted to:

The Department of Teacher Education of the
UNIVERSITY OF DAYTON

In Partial Fulfillment of the Requirements for

The Degree

Master of Science in Education

By

Jennifer D. Day

UNIVERSITY OF DAYTON

Dayton, Ohio

June 28, 2004

DEPARTMENT OF TEACHER EDUCATION
SCHOOL OF EDUCATION AND ALLIED PROFESSIONS

Date: June 28, 2004

WE HEREBY APPROVE THE MASTER'S THESIS SUBMITTED

BY

Jennifer Dawn Day

ENTITLED: A Study of Computer Literacy Skills in
First-Year Sinclair Community College Students

AS PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

Master of Science in Education


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ABSTRACT

A STUDY OF COMPUTER LITERACY SKILLS IN FIRST-YEAR SINCLAIR COMMUNITY COLLEGE STUDENTS

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University of Dayton, 2004

Advisor: James Rowley, Ph.D.

This thesis is a descriptive, exploratory study designed to gather data regarding the computer literacy skills of first-year college students. The purpose of the research study focused on four areas. These areas were to identify the perceived level of technology skills that students possess upon entering college, how those skills were acquired, the level of importance students place on those skills being acquired prior to a student entering college, and the preferred method of learning those skills.

In this study, the researcher designed and administered a 23-item survey to 215 students at Sinclair Community College. The data were collected via Scantron forms. Data were analyzed and coded by categorizing and recording similar responses. The results of this study indicate that students' perceived technology skills vary by computer application. The results of this study also show the level of importance students place on various technology skills being possessed prior to entering college. Further research needs to occur in the area of computer literacy skills of first-year college students and the impact that various technology skills may have upon first-year college students.

To my family and friends for their love, support and encouragement.

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I wish to express my appreciation to those people who have supported and encouraged me during my education. I could not have achieved this lifetime goal without them.

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CHAPTER I

INTRODUCTION OF STUDY

Basic computer and technology skills are rapidly becoming more essential in today's society. Today, banking, shopping, and taking classes toward a degree all can be done at home with the use of technology. As technology progresses and impacts more of our daily lives, it is necessary to ensure individuals have a basic foundation of computer and technology skills.

Computer literacy refers to competencies associated with information technology fluency. It can be defined as having an understanding of and the skills necessary to live in a society that is becoming increasingly more dependent upon computer technology. Basic computer skills range from formatting diskettes, logging on and shutting down a computer, word processing, email and web browsing to more complex skills, such as designing a web page, evaluating the content of a web site, and designing a database. Other skills include the use of input and output devices (such as a mouse and keyboard), creating and managing files and subdirectories, and using spreadsheet and presentation software. According to John P. Bailey, the director of educational technology for the U.S. Department of Education, technology literacy involves "taking the right kind of technological tools [and] applying it [*sic*] to different tasks in problems that students face inside the classroom, and that we face in work as well" (Trotter, 2003, ¶ 2). The National Research Council Committee on Information

Technology Literacy (1999) refers to computer literacy as "the ability to use a few computer applications" (p. 11).

A variance exists in the basic information technology skills students initially possess upon entering higher education institutions. There is a computer competency gap that is becoming more evident among incoming college students. Some students arrive at college already knowledgeable about and fluent with computers and information technology, yet others arrive at college rarely or never having touched a computer. These variances in competencies create a complex challenge for counselors, educators, and students.

Today it is becoming increasingly important for individuals entering college for the first time to possess some basic computer and information technology skills in order to be successful in a course of study. Therefore, what is the computer skill level of students entering college today? Are these students computer literate, and what computer skills do they possess that make them computer literate and able to successfully complete a college course that may require the use of a computer to complete an assignment? More specifically, what are the computer competencies held by first-year community college students based on their perceptions? What computer competencies do instructors teaching entry-level college courses expect students to possess in order to be successful in their classes? The technology skills that are essential for an incoming college student to be successful are debatable. In addition, the skills

that make college students technology fluent or computer literate are ever-evolving.

Purpose of the Study

The purpose of this study was to identify the perceived technology competencies that students possess upon entering Sinclair Community College and how those skills were acquired. In addition, the study queried students on what technology competencies they believed were important prior to entering college and the preferred method of learning those technology skills. Sinclair, a comprehensive single campus college located in Dayton, Ohio has an enrollment consisting of students from varying ages and backgrounds with different technology skill levels. This study specifically explored students' skill levels in basic computer applications. Students completed a self-assessment on the skill level they possessed pertaining to six areas of computer applications ranging from the Internet to database management. In addition, students were queried on the relative importance placed on various technology skills. Students also were queried on their preferred method of learning technology skills, how they acquired the skills they possessed at the time of the survey, and if they believed a basic computer skills course should be required of students entering Sinclair Community College.

In an effort to conduct this study, the researcher designed a 23-item survey (see Appendix A), which was administered to 215 students during the Spring 2004 term. The researcher selected two courses from each academic

division in which to administer the survey. Data were collected via Scantron forms. Three of the Scantron forms were eliminated due to mismarkings rendering the data unusable. Demographic information also was collected, allowing the researcher to conduct an analysis based on age and number of hours of college courses completed.

Definition of Terms

The following terms were used in this study:

Computer Application: "a computer program, or collection of programs, designed to provide some functionality to the end user. Typical examples of such programs are word processors, spreadsheets, accounting programs and media players." (www.websters-dictionary-online.org, 2004)

Computer (Technology) Literacy: "the level of expertise and familiarity someone has with a computer; generally refers to the ability to use applications rather than to program." (www.webopedia.com, 2004)

Distance Learning: "learning that takes place via electronic media linking instructors and students who are not together in a classroom." (www.merriamwebster.com, 2004)

Limitations

This study had a few limitations that should be considered. First, the researcher did not randomly select participants in this study. Participants for this study resulted from the researcher purposely selecting the classes to ensure instructor willingness in allowing the survey to be administered to the instructor's

class. In addition, the researcher selected classes that would be more probable to have first-year students enrolled.

Also, the survey in this study was administered to students enrolled in class sections that were held in a classroom and taught in a face-to-face format. The survey was not administered to distance learning sections of courses offered during the Spring 2004, nor was it administered to students completing courses via independent study.

Another limitation of this study was related to the survey participants. Survey participants may not have had an understanding of the technology terms listed in the survey. In an effort to control this, the researcher listed examples for each technology skill queried in the survey.

A final limitation to this research study relates to the students' self-assessment of their technology skill level. The students' self-assessments may not have adequately reflected their actual skill level for a specific computer application.

Significance of the Study

The data collected in this research study can be used to help leadership determine what steps are necessary to ensure that students entering Sinclair Community College are technologically prepared to begin their college education. Furthermore, this research study provided a foundation upon which further research can occur in regards to the technology skill level of first-year college students.

Summary

This chapter provided an overview of the background, purpose, and significance of this research study. In addition, terms relating to this study were defined and limitations of the study were stated. Chapter Two is a review of the literature pertaining to computer literacy in regards to basic skills being obtained, students' perceptions of their technology skill level, gender-based differences that may exist, and employers' expectations of computer literacy in college graduates.

CHAPTER II

REVIEW OF THE RELATED LITERATURE

In this chapter, the researcher reviewed literature pertaining to computer literacy. The review is divided into four main components: what, how and when competencies are obtained; students' perceptions of the computer competencies they possess; gender-based differences; and employers' expectations of computer literacy in college graduates.

Students attending college for the first time will begin taking some general education courses, such as English, biology, and math. In a typical college English class, students are expected to submit papers for course assignments. One of the requirements for submitting a paper typically is that it must be typed double-spaced using a word processor. A student who is entering college who has never touched a computer may feel that this requirement is intimidating and perhaps a prerequisite of skills or knowledge he or she does not possess for successfully completing the course, and yet a skill that was not listed as being necessary for enrolling in the course. This situation can potentially result in a student not being successful in a college course, and ultimately may result in the student withdrawing from a college course. Therefore, how computer literate are today's students entering college for the first time? Do these students possess the computer and technology skills necessary to successfully complete a course upon entering college? What are the computer competencies held by first-year college students based on their perceptions? And what are the computer

competencies that instructors perceive students to possess during the first year of college? The purpose of this chapter was to review the literature related to these important questions.

What, How, and When Computer Competencies Are Obtained

Studies have been conducted regarding computer literacy and how students perceive themselves. There are variances in the level of proficiency pertaining to computer skills that students perceive themselves as possessing versus the computer skill level they actually possess upon entering higher education institutions. These variances have been illustrated in various research studies that have been conducted in recent years. In order for students entering college for the first time to be successful, it is necessary for them to possess at a minimum basic computer and technology skills.

In a study that surveyed students at Southwestern University (SU) in Georgetown, Texas, a contemporary skills element of the survey focused on the functions a computer was used to perform (McEuen, 2001). These functions were categorized into levels of complexity. Email, web browsing, and word processing were considered low-level skills; creating web pages and working with graphics were considered mid-level skills; and working with data was considered a high-level skill. Fifty-eight percent of the students surveyed reported never using a computer to design a web page. Fifty-two percent of the students reported that they sometimes used a computer for high-level skills, such as working with data. (p. 14)

Ninety-seven percent of students who responded to the survey reported owning a personal computer. McEuen (2001) also collected data in regards to the use of a computer in high school. Of the students who responded to the survey, 22.8% reported that the use of a computer was part of their high school learning most, if not all of the time, 45.8% reported using a computer some of the time in high school, and 31.5% reported rarely or never using a computer in high school. Nearly one-third of the students surveyed rarely or never used a computer in high school. (p. 11)

In McEuen's (2001) study, the use of electronic resources to solicit input for a research study did exclude those not using the technology available to them and perhaps skewed the results of the survey. The nearly one-third of students completing the survey and reporting rarely or never having used a computer in high school represents a gap in the basic computer and technology skills and background skills that students possess upon entering higher education institutions.

There were 40 students willing to provide additional information in a personal interview, of which half were randomly selected. Seventeen of the twenty students selected actually participated in a personal interview session. Prior to the interview, each student was informed of the purpose of the study. The interview was divided into four sections. The first section focused on students describing basic computer and technology skills they possessed prior to arriving at SU and how they had acquired those skills. The majority of students

responded that they possessed basic skills such as email and word processing prior to arriving at SU. In addition, many students reported that these basic computer skills were self-taught. (p. 15)

The second section of the interview focused on basic computer and technology skills students had learned since arriving at SU. Once again, students were asked to report where they acquired the knowledge and skills. Basic web site design was the only skill that several students reported learning since arriving at the university. Word processing, Internet research, and creating a spreadsheet were some of the other skills reported. (p. 15)

In the third section of the interview, students were asked to identify skills they thought would be necessary following graduation. The majority of students reported they felt a need to understand how a computer operates, as well as be able to troubleshoot computer problems. In addition, many students felt it was important to have a better understanding of researching and evaluating information on the Internet. (p. 15)

Lastly in the interview, students were asked to provide types of learning experiences they felt could provide acquisition to the various skills necessary to be successful after graduation. Integrating technology into existing courses, seminars and workshops were just a few of the responses provided by students. (p. 15)

Another research study conducted a few years prior to the McEuen (2001) study revealed different findings. The study was conducted at the State

University of New York (SUNY) College of Agriculture and Technology at Morrisville in Fall 1999. The purpose of the study was to determine what skills students possessed prior to entering college (Weiler, 2001). Questionnaires were administered to students enrolled in freshmen English classes, with 340 (26%) of the questionnaires being collected. Six percent of those freshmen surveyed reported that they had never used the Internet, while thirty-nine percent reported using the Internet at least "once a day." Sixty-one percent reported using the Internet "once a week" or less. In regards to previous computer training or skills students possessed prior to entering college, 54% reported they possessed computer skills prior to entering college.

Similar findings to the McEuen (2001) study were reported in a study conducted at the University of Wisconsin-Stout (UW-Stout) (Furst-Bowe, Boger, & Franklin, '95-'96). Almost half of the respondents reported having acquired computer skills in high school. The remaining respondents reported acquiring computer skills either at home, through work experience, at the University, or through other sources. In addition, nearly two-thirds of the respondents did not own a computer. Significant differences were reported in regards to the computer competencies of computer owners versus non-computer owners. The computer owners had a tendency to be more competent in basic computer skills, spreadsheets, database management, graphics, and information retrieval/telecommunications. The majority of student respondents believed that computer skills were at least somewhat important for future employment, in

contrast to only 2% indicating that computer skills were not important. Seven percent were unsure of the importance of computers.

Students' Perceptions of the Computer Competencies They Possess

Studies regarding computer literacy and how students perceive themselves related to computer literacy have been conducted. Results from these studies have demonstrated variances in the level of proficiency that students perceive themselves possessing versus the skill level they actually do possess.

A focus of a Fall 2001 survey administered at Colorado State University (CSU) was to investigate the information technology skills of incoming freshmen, including those newly transferred students to CSU, regardless of incoming rank. A seventy-one question, paper-based Scantron survey was administered to students enrolled in a required Freshman Seminar course. A 54% response rate was obtained. Approximately 1,933 freshmen, 118 sophomores, and 28 juniors completed the survey (p. 37). (Kaminski, Seel, & Cullen)

The survey administered in the Kaminski et al. (2003) study contained questions pertaining to email, the World Wide Web, software, hardware, and support in regards to preferred method of learning technology. The results from the survey showed that 98% had an email account, 81% had knowledge of attaching files to email messages, and 87% had been using the World Wide Web for the past two or more years. An additional 9% had been using the World Wide Web for the past year. (Kaminski et al., p. 37)

In addition, the survey results showed that 92% possessed basic skills in setting up a computer and installing software and plug-ins. Only 41% of those students completing the survey had knowledge of how to download and read a Portable Document Format (PDF) file. (Kaminski et al., p. 38)

A similar research study was conducted in Spring 2001 at Southwestern University (SU) (McEuen). In McEuen's study, students at SU were surveyed regarding how fluent they perceive themselves in information technology. The university planned to use the information gathered in the research study to evaluate and enhance the current university curriculum with competencies relating to information technology at SU. Enrollment at the time of the survey was 1,239. (p. 10)

The research study focused on three elements: foundational concepts, contemporary skills, and intellectual capabilities. Since all students at the university had campus email accounts, the survey was advertised through the campus-wide email system. Email notifications requesting participation in an online survey were sent at two different times to all students enrolled during the Spring 2001 semester. Three hundred and twenty-one responses were recorded as a result of the first email notification, and an additional seventy-seven responded as a result of the second email notification, with five of those responses being discarded due to incomplete data. All student classes (freshman, sophomore, junior, and senior) were represented, as well as a variety of student majors. (McEuen, 2001, p. 11)

Students completed a web-based design form, self-assessment survey, consisting of grouped questions (not in random order). The web-based form contained mostly Likert-style questions on a scale of one to ten, in which students rated their skill level for various elements. (McEuen, 2001, p. 11)

In McEuen's (2001) survey, there were two questions pertaining to adaptability and comfort level regarding learning new software applications. Eighty-nine percent of the students reported feeling comfortable and confident when using new technology. Of those students surveyed, only 11% reported a low comfort and confidence level when using new technology. In regards to learning new software and the use of resources to learn new technology, 92% of the students reported they preferred to try and figure it out by themselves. (p. 12)

The computer skills students possess also were the focus of a study conducted by Furst-Bowe et al. (1995-96) a few years prior to the McEuen (2001) study. Faculty and staff at the University of Wisconsin-Stout (UW-Stout) found widely differing levels of computer competency among students in the classroom and laboratories. As a result of these variations in computer competency levels, a total quality management team consisting of 10 faculty, staff and students at UW-Stout was developed in Fall 1993. The team's primary focus was to examine student competency in the use of computers. How computer competencies should be obtained and who was to provide the training to obtain these competencies were issues the team needed to address. Their

goal was to identify four main objectives pertaining to computer competencies: (1) computer competencies of current UW-Stout students, (2) faculty members' expectations of students, (3) expectations of UW-Stout alumni for graduates entering the workforce, and (4) employers' expectations of graduates entering the workforce.

The team developed a survey to obtain data on required computer competencies that consisted of skills pertaining to basic computing, word processing, spreadsheet, database management, graphics/multimedia, and information retrieval/telecommunications. The survey was administered to 157 randomly selected students enrolled in freshman English classes, 50 randomly selected alumni who graduated in May 1991, 32 faculty members consisting of the undergraduate program directors at UW-Stout, and 100 employers who had recruited from the campus most recently. The overall response rate was 79%. The results of the survey were divided into five sections consisting of overall computer competencies, student results, alumni results, program director results (faculty), and employer results. In the section pertaining to overall computer competencies, results provided insight into computer competencies to be addressed within the various curriculum programs at UW-Stout. (Furst-Bowe et al., 1995-96)

Various student demographics were represented in the study. Fifty-five percent of the respondents were female, fifty-five percent of the respondents were freshman, twenty percent were sophomores, and there was nearly equal

representation of juniors and seniors (p. 5). Various academic backgrounds were represented as well, with industrial technology and education being the most common majors. (Furst-Bowe et al., 1995-96)

As a result of the study, a set of core computer competencies was developed for the UW-Stout. The computer competencies pertaining to the use of operating systems a graduate would possess included managing files, generating research reports, creating spreadsheets, creating databases and running queries and sorts, creating charts and graphs, and sending and receiving email. In addition, various academic programs required specific computer skills that pertained to their particular program. A procedure to ensure that students acquired computer skills was developed by the research team and a variety of recommendations to assist students in acquiring those skills was implemented, with a review and update of the recommendations and a survey being conducted on an annual basis. (Furst-Bowe et al., 1995-96)

A research study conducted in February 1999 had similar findings to the Furst-Bowe et al., 1995 study. The study, involving 184 first-year psychology students at Maastricht University located in the Netherlands, revealed that 112 students (60.9%) owned a computer, and 179 students (97.3%) reported using a computer once in a while. In addition, students were surveyed regarding their computer experiences and how they perceived their skill level. Twenty-five percent of the respondents perceived themselves as "unskilled" or "highly unskilled" and thirty-eight percent perceived themselves as "neither skilled nor

unskilled" in computer experience. Of the 184 respondents, 75% were female and 25% were male. (Beckers & Schmidt, 2001, p. 40)

In another sample study conducted one year later involving 149 first-year students and 76 third-year students, the sample population reported characteristics similar to those reported by the sample population one year earlier. They reported similar skill levels and perceptions of themselves regarding computer proficiency. This sample population consisted of 177 females (78.7%) and 48 males (21.3%). (Beckers & Schmidt, 2001, p. 40)

A more recent study regarding students' perceptions of the computer competencies they possess not only included a student self-assessment survey, but also a performance-based component. Nowicki's (2003) research study investigating college and university students' use of World Wide Web search engines consisted of a pre-experiment questionnaire in which students were asked to describe individual computer, World Wide Web, and Web searching experience. After completion of the questionnaire, students performed searches on the World Wide Web on a topic using six different pre-selected search engines. Results from Nowicki's study revealed the following:

There was only a modest correlation between search success and library catalog use, computer use, and how often students used search engines when looking for information on the World Wide Web. However, it is clear that the frequency with which students used the World Wide Web, online databases and indexes, and search engines themselves was highly

correlated with students' average rates of search success in this experiment. (p. 508)

Nowicki noted that "some students did not complete the experiment altogether because of a lack of computer skills or a lack of familiarity with the World Wide Web" (2003, p. 511). In addition, "the pre-experiment questionnaire revealed that the students involved in this study had relatively little computer experience and information retrieval skills" (Nowicki, 2003, p. 511).

Gender-Based Differences

Gender-based differences regarding computer competencies also have been studied. There were variations in the data reported regarding the computer competencies that males versus females perceived themselves to possess.

In the study conducted at Southwestern University (SU), female students reported using a computer 48% of the time for communication purposes and 35.3% of the time for schoolwork (McEuen, 2001). In contrast, male students reported using a computer 44% of the time for entertainment purposes and 25.8% of the time for schoolwork. (p. 11)

A section of the survey regarding foundational concepts revealed that students rated themselves low in regards to computer operations and how information is processed. Males and females were at opposite ends of the scale in identifying a computer problem as either hardware or software related, and defining and giving examples of computer storage and computer memory. Males were at 72.9% and 72.8%, respectively; and females were at 44.5% and 29.8%

respectively. In regards to network and infrastructure comprehension, the majority of students rated themselves low, with females rating themselves lower than males. (McEuen, 2001, p. 13)

Many studies regarding gender-based differences pertaining to computer technology skills also were referenced by Morritt (1997). A 1992 study by Shashaani found differences in attitudes toward computers among high school girls and boys. Morritt referenced contradictory research findings by Reinen and Plomp (1993), Kay (1992) and Ogletree and Williams (1999). Each of these studies' reported that there were no significant differences between males' and females' attitudes towards computers.

Employers' Expectations of Computer Literacy in College Graduates

There are many expectations placed upon college graduates. The competencies that employers desire of recent college graduates vary depending on the position and department. Various studies have been conducted regarding employers' expectations of graduates in regards to computer skills graduates "should" possess after graduation.

The purpose of a study conducted in 1997 by Philip Davis, an Instructional Technology Librarian at Cornell University's Albert R. Mann Library, was to identify which computer skills employers felt were essential when recruiting recent graduates of the university. A questionnaire was designed to gather information in five computer literacy categories: creating documents and multimedia, working with computer programs, managing databases,

manipulating numeric data, and computer networks. There were 150 out of the 300 questionnaires mailed that were valid and usable.

Results of the survey revealed that employers generally have high expectations of computer literacy in recent college graduates. Over 83% indicated that computer competency skills are "important" or "very important" in the hiring decision of a candidate. Ninety-six percent of employers ranked word processing skills the highest, expecting employees to have at least basic word processing skills. However, 65% of employers did not feel that desktop publishing skills were essential in their recruitment of recent college graduates. Seventy-five percent of the employers responding to the survey desired basic graphic or presentation software skills, in contrast to seventy percent who did not consider creating Internet documents to be a skill they expected a recent college graduate to possess. In the section of the survey pertaining to working with computer programs and the ability to install or upgrade software, 61% of employers sought those skills in their recruitment of college graduates, and 31% did not feel this skill was very important or relevant in their recruitment selection process. In the area of database management skills, basic database entry and editing skills were considered basic and expected skills by 83% of the recruiters. In the section of the survey pertaining to numerical data skills, 86% of the recruiters who responded to the survey reported expecting spreadsheet skills and even the ability to perform a detailed analysis. In regards to computer network

skills, 93% expected email experience, and slightly over 63% expected a graduate to be competent with online and Internet searching. (Davis, 1997)

Employers had the opportunity to express comments to open-ended questions in the final section of the survey. In a subsection entitled "Variability of Employment," many employers agreed that "computer literacy is important to all," and "if a student graduates without any [skills], he/she will have a distinct disadvantage in the workforce." (Davis, 1997, p. 9 ¶5)

In the study conducted at UW-Stout, employers had a similar response to the findings of other studies (Furst-Bowe et al., 1995-96). In addition, the expectations of students, alumni, and employers' for computer skills were consistent. The variety of employers surveyed indicated that many computer competencies are required of their employees. In addition, a variety of organizations were represented with the alumni who were surveyed. The majority of alumni worked for companies with less than 500 employees. Computers were used for a variety of tasks in their work.

Of the respondents who were undergraduate program directors at UW-Stout, 93% indicated that computer skills were either essential or very important for graduates of their programs, and all of them felt they were at least somewhat important. Nearly three-fourths of the program directors reported that courses in computers are required within their program curricula. In regards to when computer skills needed to be acquired, more than one-third indicated that students needed to have computer skills prior to entering the program, nearly

one-third indicated that students needed computer skills upon completion of half the program curriculum, and nearly one-third indicated that students needed to have computer skills when they graduate. (Furst-Bowe et al., 1995-96)

Many different options for developing basic computer and technology skills need to be explored and perhaps made available to students upon entering college in order to bridge the gap and make students successful throughout their college career and after they graduate from college. The varying technology skill levels of incoming college students creates a challenge to the educator who is integrating technology into the curriculum, and therefore is increasingly becoming a more critical issue that needs to be addressed. Many options are being explored regarding how to bridge this gap among incoming college students and assist them in the skills necessary to become computer literate.

Summary

A review of literature pertaining to computer literacy was reviewed in this chapter. What, how and when computer competencies are obtained was the focus of the first portion of the chapter, followed by students' perceptions' of the computer competencies they possess, and gender-based differences. The final portion of the chapter presented information regarding employers' expectations of computer literacy in college graduates. In Chapter Three, the researcher will describe the methodology employed in this study.

CHAPTER III

METHODOLOGY

The purpose of this research study was to identify the perceived technology competencies that students possess upon entering college, how they acquired those skills, the level of importance placed on those technology competencies prior to a student entering college, and the preferred method of learning technology skills. How technology fluent are students entering college for the first time? Do entering college students feel they possess the technology skills needed to be successful in college courses? Chapter Three describes the methodology the researcher employed in conducting this study, including the setting, participants, instrument design, data collection, and data analysis strategies used in this research study.

Setting

This research study occurred at Sinclair Community College located in urban Dayton, Ohio. Dayton's predominant employment opportunities include healthcare, tooling and machining, aerospace, and automotive manufacturing (Dayton Area Chamber of Commerce, 2003). Sinclair is a comprehensive, single-campus community college located in an urban setting and serves very diverse students from both rural and urban settings. According to the Sinclair Community College website, the current enrollment is approximately 24,000 students, which includes full-time and part-time students (2003). The majority of students

attending Sinclair are residents of the Dayton region, which consists of the following counties: Butler, Clark, Darke, Greene, Miami, Montgomery, Preble and Warren Counties. According to the Dayton Area Chamber of Commerce, the current estimated population for the Dayton region is 1,559,048.

Participants

The researcher selected two classes from each of five academic divisions and three classes from an additional academic division at Sinclair Community College to participate in this research study. There was a total enrollment of 283 students enrolled in the 13 classes purposively selected by the researcher. A total of 215 students (80%) were present in class during the time the study was conducted. Three response forms were eliminated due to mismarkings rendering the data unusable. The study was conducted during the Spring 2004 term during the time span of April 13 through May 10.

Anonymity of all informants was protected by assigning numbers to use in the analysis and reporting of the data. An audit trail was maintained by keeping all documentation of the research process.

Research Design

The study was a descriptive, exploratory study designed to explore the computer literacy of first-year college students. In an effort to conduct that exploration, the researcher designed a 23-item survey, in which 212 valid Scantron forms were collected during the Spring 2004 term.

Instrumentation

The instrument was designed to explore the technology skills students perceive themselves to possess, as well as the importance and preferred method of learning technology skills. It consisted of a questionnaire containing 23 closed-ended questions with a limited number of response options for each. It was designed to collect quantitative numeric data and was divided into four distinct sections.

The first section covered demographics. This section included age, number of college credit hours of courses completed, and how technology skills possessed prior to entering college were acquired.

The second section of the survey consisted of a self-assessment of technology skill level for various types of software that students perceived themselves to possess. Technology skills included word processing, spreadsheet, presentation, and database software, as well as email and the Internet and World Wide Web. Students rated their skill level based on the following categories: very strong, strong, average, weak, and very weak.

The third section of the survey consisted of students rating the level of importance they placed on the same technology skills covered in the first section. Students rated the level of importance by choosing from the following options: highly important, important, not important, and unsure.

The fourth section of the survey consisted of rating the preferred method for acquiring technology skills. Items were rated highly preferred, preferred, not

preferred, or unsure. Items included completing an online course, completing a technology skills course in a classroom setting, completing a technology skills workshop, completing a computer-based tutorial program, working alone with the guidance of a "how to" book or manual, and teaching one's self through exploration and experimentation.

Data Collection

During the first half of the Spring 2004 term at Sinclair Community College, the researcher purposively selected two faculty from each of the six academic divisions and invited them to participate in a research study. The researcher selected faculty who taught classes considered first-year level courses. All but one of the courses to which the survey was administered were 100-level courses.

In order to get an adequate sampling, the researcher purposively selected two classes from five academic divisions, and three from the remaining academic division. The academic division having three classes represented was considered the largest academic division during the spring term based on enrollment and headcount.

Paper-based surveys were administered to students enrolled in one of the 13 classes selected to participate in the study during the regularly scheduled class time. Responses were collected via Scantron forms.

Data Analysis

The researcher coded the data by categorizing and recording the number of occurrences of similar responses. These similarities were used to locate emerging themes in the results of the data. Data were analyzed and significant data reported using pie and bar charts.

Summary

In this chapter, the researcher presented an overview of the methodology used in the research study. Detailed information regarding the setting, participants and instrumentation also were included in the chapter. In addition, the data collection and analysis were described. A detailed description of the data results will be provided in Chapter Four.

CHAPTER IV

RESULTS

The purpose of this chapter is to report the results of a research study conducted at Sinclair Community College during the Spring 2004 term. The study focused on the technology skills that students possessed, as well as how they acquired those skills.

The researcher will report the results of this study by sections. These sections include demographics, a self-assessment of current technology skills, the importance of various technology skills, and the preferred method of learning those technology skills.

Section I: Demographics

There were three questions in the survey that focused on demographics. Item 1 focused on the current age of the student completing the survey. Seventy-two (34%) of the students who completed the survey were age 20 and younger. Eighty students (37.7%) were between the ages of 21 and 30. Thirty-two students (15.1%) were between the ages of 31 and 40, and twenty-four students (11.3%) were between the ages of 41 and 50. Of the data collected, only four students (less than 2%) were over the age of 50.

The second item of the survey was concerned with the number of hours of college courses completed. Of those participating in the research study, 156 students (73.6%) had completed 45 or fewer quarter hours, therefore being

classified as first-year college students. Of those classified as first-year college students, 59 students (27.8%) had completed between 0 and 15 quarter hours, 58 students (27.4%) had completed between 16 and 30 quarter hours, and 39 students (18.4%) had completed between 31 and 45 quarter hours of college courses. There were 56 students (26.4%) out of the 212 who had completed more than 45 quarter hours. (See Figure 1)

Item 3 of the survey asked students to self-assess and rate their overall technology skills ranging from a level of very strong to very weak. Nineteen students (9%) self-assessed their current overall technology skills to be very strong, 78 students (36.8%) assessed their skill level as strong, 92 students (43.4%) as average, 22 students (10.4%) as weak, and only 1 student (0.5%) as very weak. (See Figure 2)

Section II: Self-Assessment of Technology Skill Level

In this section of the survey, students self-assessed their skill level for selected computer applications. There were six types of computer applications included in the survey. Computer applications included word processing, spreadsheet, presentation, database, email, and the Internet and World Wide Web. Students self-assessed their skill level as very strong, strong, average, weak, or very weak for each of the selected computer applications.

There were 111 students (52.4%) that self-assessed their skill level for word processing as either strong or very strong. The majority of students,

Figure 1. Student demographic by number of college credit hours completed.

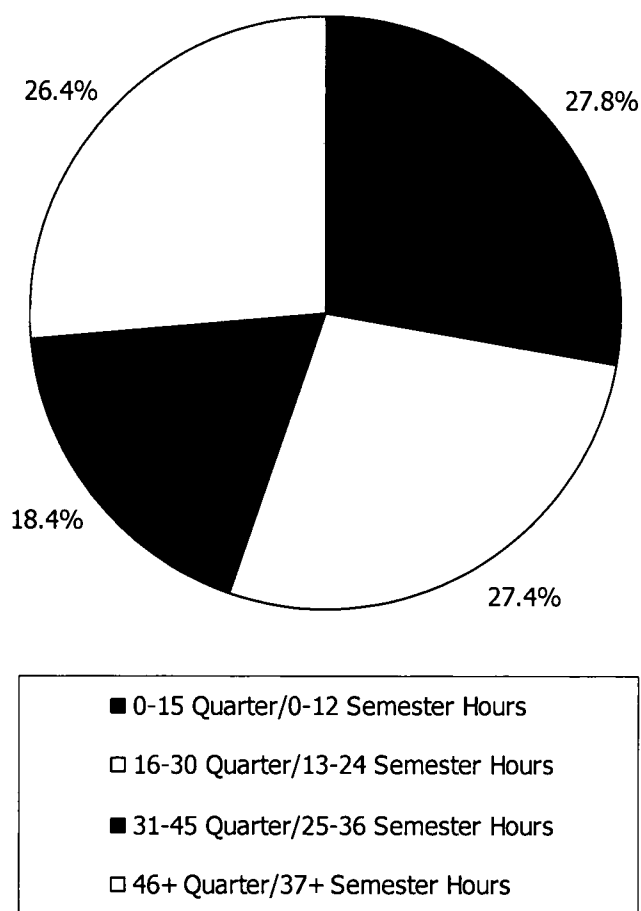
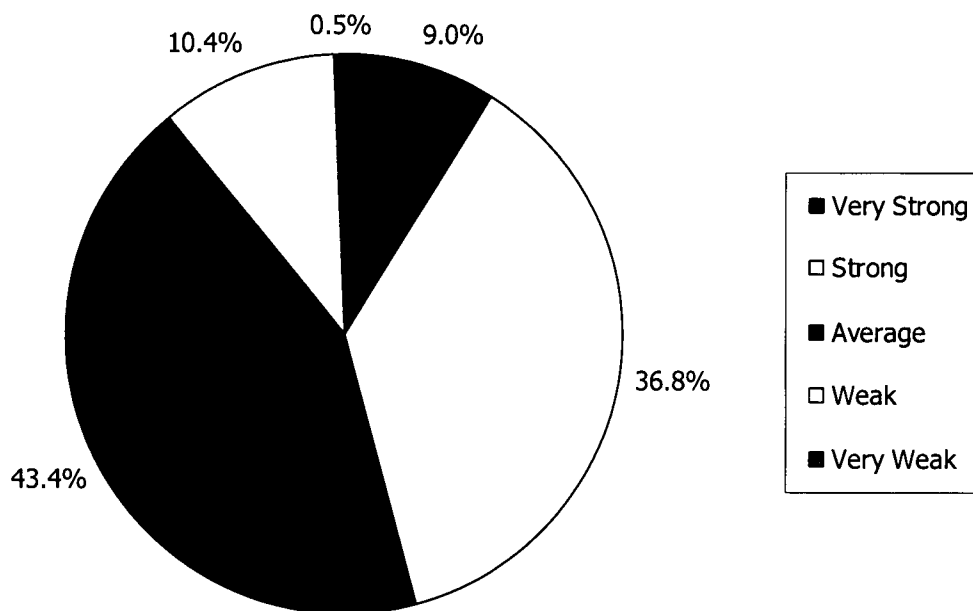


Figure 2. Students' self-assessment of overall technology skills possessed.



77 (36.3%), self-assessed their skill level as average. Twenty-four students (11.3%) believed their skill level for word processing either was weak or very weak.

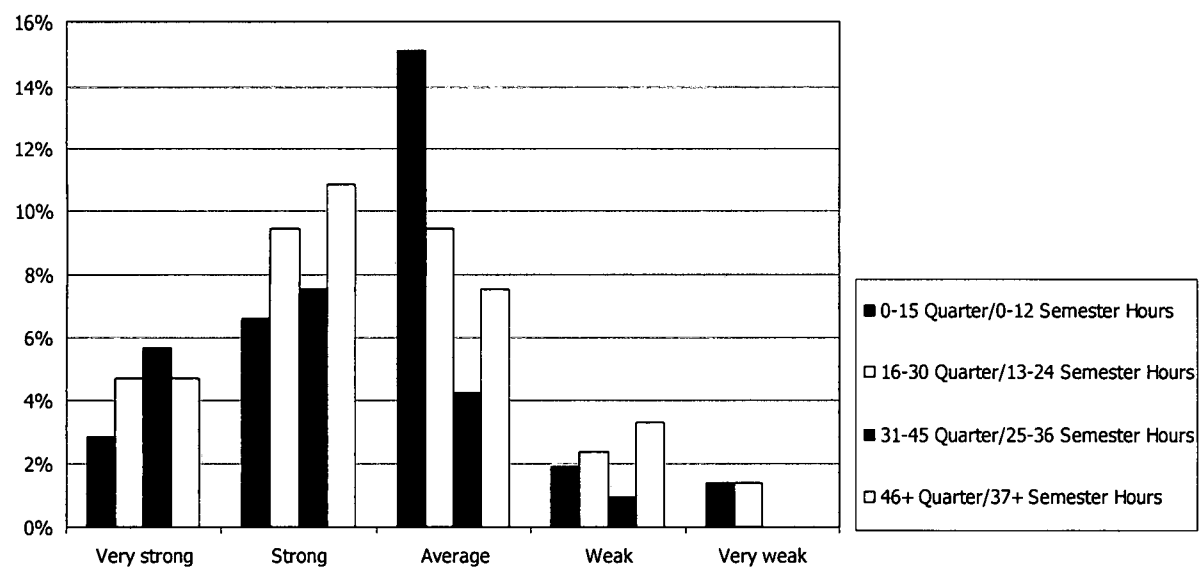
Further data analysis focusing on those categorized as first-year college students, defined as having completed less than 46 quarter hours, revealed similar results. Seventy-eight students (36.8%) self-assessed their skill level for word processing as either strong or very strong. (See Figure 3)

The researcher found it interesting that students who had completed 31 or more quarter hours of college courses did not report a skill level as very weak for word processing. The researcher believes this may be due to the requirements in completing assignments of first-year level college courses, with English composition being one of those courses that may require the use of word processing.

The results for spreadsheet software were different from those reported for word processing. Only 61 students (28.8%) self-assessed their skill level for spreadsheet software as either strong or very strong. Eighty-five students (40.1%) rated their skill level as average, and sixty-six students (31.1%) reported a skill level of either weak or very weak.

Analyzing the data of those students considered first-year college students, 40 students (18.9%) rated their skill level for spreadsheet software as strong or very strong. Sixty-one students (28.8%) rated their skill level as

Figure 3. First-year college students' self-assessment of word processing skills possessed.



average, and fifty-five students (25.9%) rated their skill level as either weak or very weak.

The next item asked students to self-assess their skill level pertaining to presentation software. Seventy-five students (35.4%) students self-assessed their skill level as either strong or very strong. Seventy students (33%) reported a skill level of average, and sixty-seven students (31.6%) rated their skill level as either weak or very weak.

Those categorized as first-year college students revealed that 53 students (25%) self-assessed their skill level as strong or very strong and 55 students (25.9%) self-assessed their skill level as average for presentation software. There were 48 students (22.6%) who self-assessed their skill level as weak or very weak in using presentation software.

In contrast to the previously reported software, database software had the lowest overall ratings. Only 25 students (11.8%) reported a skill level for database software that was either strong or very strong. Seventy-eight students (36.8%) rated their skill level as average. There were 109 students (51.4%) who self-assessed their database skill level as either weak or very weak.

Data analysis of first-year college students revealed that only 16 students (7.5%) rated themselves as strong or very strong for database software. However, 58 students (27.4%) rated their skill level as average, and 82 students (38.7%) rated their skill level as weak or very weak for database software.

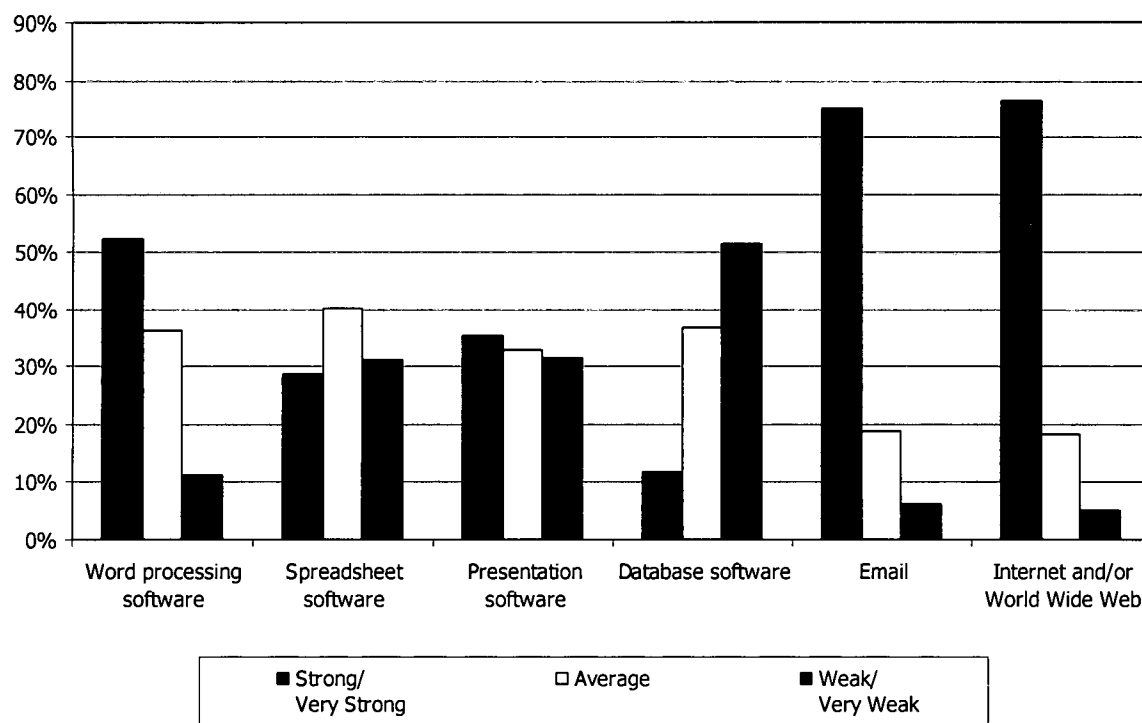
Email was self-assessed as one of the highest possessed skill levels. There were 108 students (50.9%) who self-assessed their skill level in regards to email as being very strong. Fifty-one students (24.1%) reported a skill level of strong, and forty students (18.9%) reported a skill level of average. There were only 11 students (5.2%) who perceived their skill level for email as weak and 2 students (0.9%) who reported a very weak skill level.

Skills using email also were rated highly among first-year college students. Data analysis revealed that 76 students (35.8%) rated their skills in using email as very strong. Thirty-nine students (18.4%) rated their skill level using email as strong, and 30 students (14.2%) self-assessed their skill level as average. There were only 11 students (5.2%) who self-assessed their skill level using email as weak or very weak.

Skill level for the Internet and World Wide Web was rated the highest among the computer applications listed in the survey. Ninety-four students (44.3%) believed their skill level in regards to the Internet and World Wide Web was very strong, and sixty-eight students (32.1%) believed their skill level was strong. There was a cumulative total of 162 students (76.4%) who rated their skill level for the Internet and World Wide Web as very strong or strong. Thirty-nine students (18.4%) reported their skill level as average. Only 11 students (5.2%) rated their skill level as weak or very weak. (See Figure 4)

Further analysis of the data by first-year college students revealed 67 students (31.6%) perceived their skill level for the Internet and World Wide Web

Figure 4. Students' self-assessment of technology skill level possessed by computer application.



as very strong. Fifty students (23.6%) reported a strong skill level, and thirty students (14.2%) perceived their skill level as average. Only nine students (4.2%) rated their skill level as weak or very weak.

Section III: Level of Importance of Technology Skills

The researcher was interested in collecting data regarding the level of importance students placed upon various computer applications. In this section, students were asked to rate each of the identified technology skills in terms of how important it was for students to possess that skill prior to entering college. Once again, students were queried on the same six computer applications as they were in Section II of the survey. They rated the level of importance as highly important, important, not important, or unsure.

Word processing software was ranked as one of the most important skills for students to possess prior to entering college. Seventy-seven students (36.3%) rated this skill as highly important. There were 115 students (54.3%) who rated this skill as important and 15 students (7.1%) rated the skill as not important for students to possess prior to entering college. Four students (1.9%) were unsure.

Data analysis of first-year college students revealed that 52 students (24.5%) felt that word processing was a highly important technology skill for students to possess prior to entering college. Eighty-nine students (42%) believed this skill was important to possess prior to college. Only 12 students (5.7%) did not feel this skill was important to possess prior to entering college.

In contrast, spreadsheet software had mixed responses. There were 23 students (10.9%) who rated this skill level as highly important, and 103 students (48.6%) rated this skill level as important for students to possess prior to entering college. Sixty-one students (28.8%) rated this skill as not important. Twenty-three students (10.9%) were unsure of the importance of students possessing spreadsheet skill prior to entering college.

Further data analysis revealed that first-year college students did not feel that possessing spreadsheet software skills prior to entering college was as important as word processing software. Only 18 students (8.5%) felt this skill was highly important, and 73 students (34.4%) felt this skill was important to possess prior to entering college. Forty-five students (21.2%) did not believe this skill was important to possess prior to entering college, and nineteen students (9%) were unsure of the importance of possessing this skill prior to entering college.

Presentation software also was ranked among one of the more important skills to possess prior to entering college. Thirty-three students (15.6%) rated this skill level as a highly important skill to possess prior to entering college. There were 119 students (56.1%) who rated this skill level as important. Forty-five students (21.2%) rated this skill level as not important to possess prior to students entering college, and 13 students (6.1%) were unsure.

Presentation software among first-year college students showed that 24 students (11.3%) believed this skill was highly important and 91 students

(42.9%) believed this skill was important prior to entering college. Only 30 students (14.2%) did not feel this skill was important for students to possess prior to entering college.

Database software was rated as the least important software skill for students to possess prior to entering college. There were 15 students (7.1%) who rated this skill level as highly important, and of those 15 students, 9 (60%) were between the ages of 21 and 30. Eighty-five students (40.1%) rated this skill level as important. Sixty-six students (31.1%) felt that this skill was not important to possess prior to entering college, and forty-one students (19.3%) were unsure.

The researcher found perceptions of first-year students particularly interesting in the area of database software skills. Twelve students (5.7%) believed that database software skills were highly important, and sixty-six students (31.1%) believed that database software skills were important to possess prior to entering college. There were 45 students (21.2%) who did not feel this technology skill was important prior to entering college. Thirty students (14.2%) reported being unsure about whether this skill was important prior to entering college. The researcher thought those responding unsure may not have an awareness of database software.

Email was among the top skills perceived as important for students to possess prior to entering college. Eighty-one students (38.2%) rated this skill as highly important to possess prior to college. There were 103 students (48.6%)

who rated this skill as important prior to college. Twenty-two students (10.4%) did not feel this was an important skill to possess prior to entering college, and five students (2.7%) were unsure.

Data analysis of first-year college students revealed that 66 students (31.1%) believed that knowledge of using email prior to entering college was highly important. Seventy-three students (34.4%) felt this skill was important to possess prior to entering college. Only 14 students (6.6%) did not feel that it was important for students to possess this skill prior to entering college.

(See Figure 5)

In this research study, the Internet and World Wide Web had the highest number of students who felt this skill was highly important for students to possess prior to entering college. There were 122 students (57.6%) who rated this skill as highly important and 75 students (35.4%) who rated this skill as important. A cumulative total of 197 students (92.9%) rated this skill as either highly important or important for students to possess prior to beginning their college education. Eight students (3.8%) did not feel this skill was important prior to college, and seven students (3.3%) were unsure.

An analysis of first-year college students revealed an overwhelming 94 students (44.3%) believed that knowledge of the Internet and World Wide Web were highly important prior to entering college. There were 52 students (24.5%) who believed this skill was important. Five students (2.4%) did not feel this skill was important to possess prior to entering college. (See Figure 6)

Figure 5. First-year college students' level of importance placed upon possessing skill in using email prior to entering college.

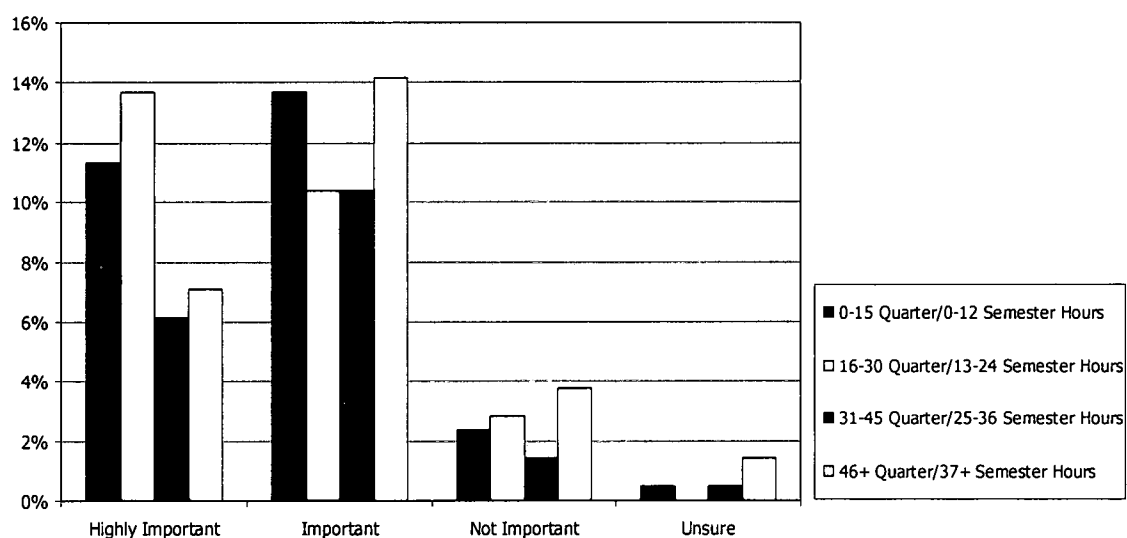
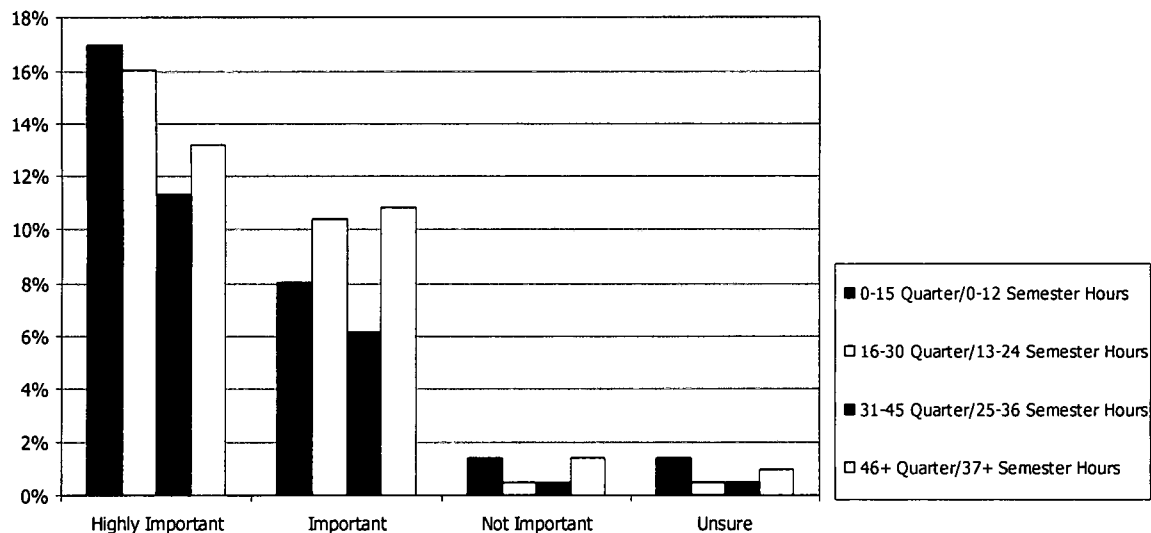


Figure 6. First-year college students' level of importance placed upon possessing skill in using the Internet and World Wide Web prior to entering college.



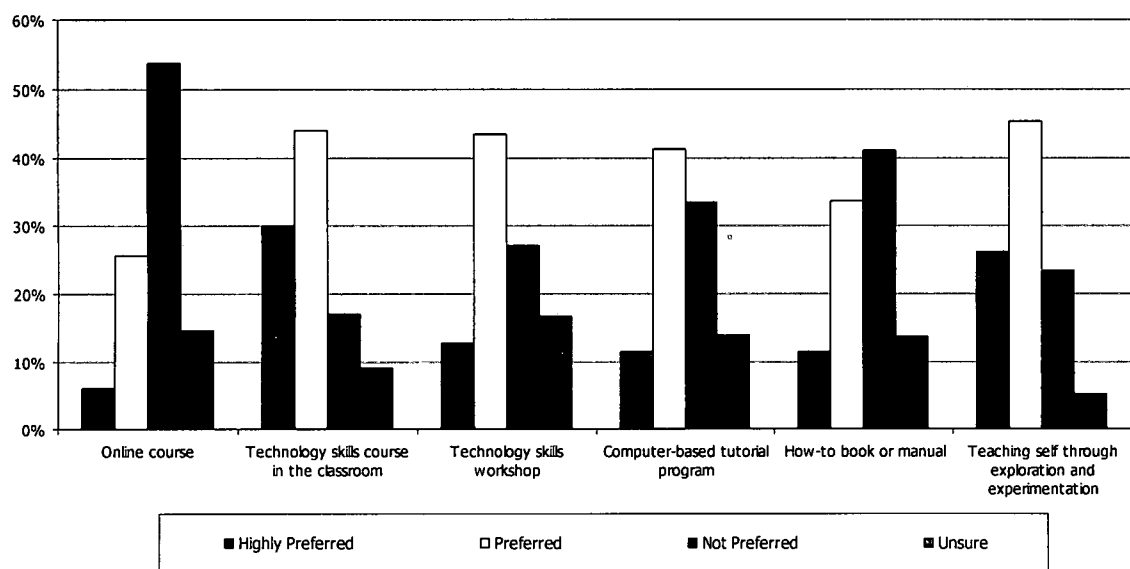
Section IV: Preference for Acquiring Technology Skills

The researcher was interested in exploring students' preference for acquiring technology skills. Students were asked to rate their preference for acquiring technology skills via six methods. These six methods included completing an online course, completing a technology skills course in a classroom setting, completing a technology skills workshop, completing a computer-based tutorial program, working alone with the guidance of a "how to" book or manual, and teaching one's self through exploration and experimentation. (See Figure 7)

Acquiring technology skills via *completing an online course* was not a preferred method of learning. It was the least preferred method of the six methods listed in the survey. Only 13 students (6.1%) highly preferred completing an online course to learn technology skills, and 54 students (25.5%) selected this method as preferred. There were 114 students (53.8%) who reported this method as not preferred for learning technology skills, and 31 students (14.6%) were unsure. The researcher believes that some students may have reported this as a preferred method due to scheduling conflicts in their personal lives, such as work and family.

Further data analysis of first-year college students revealed that nine students (4.2%) highly preferred and thirty-nine students (18.4%) preferred completing an online course to learn technology skills. An overwhelming

Figure 7. Students' preferred methods for acquiring technology skills.



85 students (40.1%) did not prefer to acquire technology skills via completing an online course, and 23 students (10.9%) were unsure.

There were 156 students (73.6%) who reported *completing a technology skills course in a classroom setting* as the preferred or highly preferred method for learning technology. Thirty-six students (17%) responded that they did not prefer to complete a technology skills course in a classroom setting to acquire technology skills, and nineteen students (9%) were unsure.

Data analysis of first-year college students revealed that 50 students (23.6%) highly preferred and 64 students (30.2%) preferred completing a technology skills course in a classroom setting as a method for acquiring technology skills. Only 29 students (13.7%) did not prefer this method and 13 students (6.1%) were unsure about this method as a preference for learning technology skills.

Completing a technology skills workshop had mixed results. Only 27 students (12.7%) highly preferred this method of learning technology skills. Ninety-two students (43.4%) selected this method as a preferred method. Fifty-seven students (26.9%) did not prefer this method for learning technology skills. Thirty-five students (16.5%) were unsure regarding learning technology skills in a workshop environment.

In regards to completing a technology skills workshop, 23 students (10.9%) of those first-year college students reported this method as a highly preferred method in acquiring technology skills. Sixty-six students (31.1%)

preferred this method. Thirty-nine students (18.4%) did not prefer this method for learning technology skills. Twenty-eight students (13.2%) reported being unsure of this method for acquiring technology skills.

Pertaining to learning technology skills via *completing a computer-based tutorial program*, 24 students (11.4%) highly preferred this method, 87 students (41.2%) preferred this method, and 70 students (33.2%) did not prefer this method. There were 29 students (13.7%) who were unsure about whether this method of learning technology skills was preferred or not.

Twenty-one students (10%) of first-year college students reported they highly preferred learning technology skills via completing a computer-based tutorial program. Fifty-eight students (27.5%) reported this method as preferred for acquiring technology skills, and fifty-eight students (27.5%) reported this method was not preferred.

Learning technology skills by *working alone with the guidance of a "how to" book or manual* was among the least preferred methods. Twenty-four students (11.3%) selected highly preferred, and seventy-one students (33.5%) selected preferred for this method of learning technology skills. Eighty-seven students (41%) reported they did not prefer this method, and twenty-nine students (13.7%) were unsure.

In contrast, further data analysis revealed that 17 first-year college students (8%) highly preferred acquiring technology skills by working alone with the guidance of a "how to" book or manual. Fifty-five students (25.9%) reported

this as a preferred method for learning technology. Fifty-nine students (27.8%) did not prefer this method and twenty-five students (11.8%) were unsure about this method for acquiring technology skills.

The last item listed in this section of the survey regarding preferred methods for learning technology skills was *teaching one's self through exploration and experimentation*. This method was among the most preferred methods listed in the survey, with 55 students (25.9%) reporting they highly preferred this method, and 96 students (45.3%) reporting this method as preferred. Forty-nine students (23.1%) did not prefer learning technology through exploration and experimentation on their own, and eleven students (5.2%) were unsure.

Forty-one first-year college students (19.3%) reported that learning technology skills by teaching one's self through exploration and experimentation was a highly preferred method of acquiring technology skills. Seventy-four students (34.9%) preferred this method, and thirty-five students (16.5%) did not prefer this method for acquiring technology skills. There were only six students (2.8%) who were unsure regarding this method.

The last item in the survey queried students in regards to whether a basic computer and technology skills course for students entering Sinclair Community College should be required. A majority, 127 students (62%), felt that a course teaching basic technology skills should be required.

Students also were asked how they acquired the technology skills they possessed prior to entering Sinclair Community College. Students were permitted to select more than one response. Due to an oversight during the analysis of the data, the Scantron device read only one response. However, out of the 212 student response sheets, 167 students (78.8%) selected only one response. The results are listed here because the researcher felt they were important. A majority, 87 students (52.1%), responded that they acquired their current technology skills by teaching themselves. Forty-six students (27.5%) responded they acquired technology skills in high school. Eleven students (6.6%) acquired technology skills via a workshop, and seven students (4.2%) by use of a "how to" book or manual. Sixteen students (9.6%) acquired the technology skills they possessed prior to entering Sinclair via some other method.

Summary

The researcher reported an analysis of the data in this chapter. Significant results were reported and illustrated via bar and pie charts. In Chapter Five, the implications of the results of this study will be discussed. In addition, the researcher will make recommendations for future research in the area of computer literacy of college students.

CHAPTER V

CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

This chapter begins with a brief synopsis of the four previous chapters. Additionally, the three conclusions of this study are presented and the researcher discusses the implications this study has for practice. Finally, the researcher presents recommendations for further research.

Summary of Chapters

Chapter One laid the foundation for this study. Specifically, it described the background and purpose of the research study. The chapter reported the increasing demand and impact of technology skills in today's society. In addition, technology skills were discussed pertaining to the perceived technology skill level of students. Furthermore, terms such as computer application, computer (technology) literacy, and distance learning were defined in Chapter One. The researcher concluded by stating the limitations and significance of the study.

In Chapter Two, the researcher reviewed literature pertaining to computer literacy. The chapter was divided into four main subsections. Subsections included what, how and when computer technology skills are obtained, students' perceptions of the technology skills they possess, gender-based differences, and employers' expectations of computer literacy in college graduates.

Chapter Three described the methodology employed by the researcher in conducting this study. A detailed account of the setting, participants and instrumentation used was included. In addition, the data collection and analysis were described. Specifically, the chapter described the research study that included 212 students from 13 classes in which a survey created by the researcher was administered. The survey was designed to measure students' perceptions regarding technology skills possessed, the level of importance students placed on those skills, and the preference for learning specified technology skills.

Chapter Four presented the results of the data analysis. The researcher reported preferences in method of acquiring technology skills, as well as the level of importance that is placed by students on knowing a particular type of computer application.

Conclusions

As a result of this study, the researcher arrived at the following conclusions:

Conclusion 1: Students' perceived technology skill levels vary by computer application.

A vast majority of the students that completed the survey in this study self-assessed their skill levels in use of email, the Internet and World Wide Web as strong or very strong. For example, there were 108 students (50.9%) who rated themselves as being very strong in using email. Fifty-one students (24.1%)

reported a skill level of strong. Ninety-four students (44.3%) perceived their skill level in using the Internet and World Wide Web as very strong, and sixty-eight students (32.1%) perceived their skill level as strong.

Database skills were the weakest technology skills students possessed. There was a cumulative total of 25 students (11.8%) who perceived their skill level for database software as either strong or very strong. The majority, 109 students (51.4%), self-assessed their skill level as either weak or very weak. The researcher anticipated this outcome due to database software not being widely utilized.

The other technology skills were ranked in between the two computer applications previously described. Other technology skills included word processing, presentation and spreadsheet computer applications. There were 111 students (52.4%) who reported possessing strong or very strong word processing skills, and 24 students (11.3%) who reported their skill level as weak or very weak. Seventy-five students (35.4%) reported their skill level with presentation software was strong or very strong, and sixty-seven students (31.6%) reported their skill level was weak or very weak. Sixty-one students (28.8%) self-assessed their skill level with spreadsheet software as strong or very strong, and sixty-six students (31.1%) self-assessed their skill level as weak or very weak.

Conclusion 2: Students assigned value to technology skills being possessed prior to entering college.

The results of the data showed that students believe it is important for there to be a level of competency in technology applications prior to entering college. An overwhelming 197 students (92.9%) out of the 212 surveyed identified proficiency with the Internet and World Wide Web as important or highly important for students to possess prior to entering college. There were 192 students (91%) who identified word processing skills as important or highly important to possess prior to entering college. Email was rated just below word processing, with 184 students (87.2%) identifying this technology skill as highly important or important prior to college.

In addition, first-year college students placed great value on students possessing skills in email, the Internet and World Wide Web prior to entering college. There were 141 first-year college students (66.5%) out of 156 who identified word processing skills as important or highly important for students to possess prior to entering college. There were 139 (65.6%) who identified email as important or highly important, 146 (68.9%) identified the Internet and World Wide Web as important or highly important for students to possess prior to entering college. Forty-five students (21.2%) felt that database skills, as well as spreadsheet skills, were not necessary to possess prior to entering college.

Conclusion 3: The relationships of the perceived skill levels and the values assigned to those skills were congruent for some computer applications and not for others.

In this study, skills using the Internet and World Wide Web ranked the highest among the students surveyed in regards to level of importance prior to entering college. Similarly, the Internet and World Wide Web ranked the highest among the skills possessed of those computer applications included in the survey. There were 197 students (92.9%) who identified the Internet and World Wide Web as an important or highly important skill to possess prior to entering college. There were 162 (76.4%) who rated their current skill level in using the Internet and World Wide Web as strong or very strong. Eight students (3.8%) did not believe this was an important skill to possess prior to entering college, and eleven students (5.2%) reported their skill level using the Internet and World Wide Web as weak or very weak.

The relationship of the perceived skill level and the value assigned to email also was congruent. There were 159 students (75%) who identified their skill level using email as either strong or very strong, and 184 students (87.2%) who rated email as a skill that is important or highly important to possess prior to entering college. Thirteen students (6.1%) identified their skill level for email as either weak or very weak, and twenty-two students (10.4%) did not feel that it was important to possess this skill prior to entering college.

There did not appear to be a relationship between skill level possessed in database software and the level of importance students placed upon it being possessed prior to entering college. Twenty-five students (11.8%) perceived their skill level using database software as strong or very strong. There were 109 students (51.4%) who perceived their skill level as weak or very weak. In contrast, 100 students (48.3%) identified database software skills as important or highly important to possess prior to entering college, and 68 students (31.9%) did not feel this skill was important to possess prior to entering college.

Conclusion 4: The preferred methods for acquiring technology skills were completing a technology skills course in a classroom setting or through personal exploration and experimentation.

The preferred method for learning technology skills as reported by students in this study was either by participating in a course or through personal exploration and experimentation. Sixty-three students (29.7%) highly preferred acquiring technology skills by completing a technology skills course in a classroom setting and ninety-three students (43.9%) preferred this method. Fifty-five students (25.9%) highly preferred learning technology through personal exploration and experimentation and ninety-six students (45.3%) identified this method as preferred.

The least preferred method for acquiring technology skills was by completing an online course. There were 114 students (53.8%) who identified this method as not preferred. Only 13 students (6.1%) reported this method

as highly preferred and 54 (25.5%) preferred this method for acquiring technology skills.

Acquiring technology skills through the use of a "how to" book or manual had mixed responses. There were 95 students (45%) who identified this method as preferred or highly preferred. Eighty-seven students (41.2%) identified this as not a preferred method for acquiring technology skills, and twenty-nine students (13.7%) were unsure.

Implications for Practice

This study has implications for leaders and administrators in higher education who have responsibility for ensuring student success and the establishment of course prerequisites. First, students may be enrolled in classes during their first year of college that require them to use technology in completing various assignments. Students may feel a lack of support in learning the course material required of them, and also learning the technology skills that may be required for them to complete the assignments.

Based on the results of this study, the researcher believes that Sinclair Community College administrators may want to consider requiring entering students to complete an assessment that tests their basic technology skills. Specifically, such an assessment might test students' skills across the six technology applications that were the focus of this study. Secondly, based on the results of such an assessment, students might be required to complete a basic

technology skills course, similar to developmental or remedial English, math and reading courses that may be required before proceeding to college-level courses.

A second implication of this study is that Sinclair administrators may want to think strategically about how they might work more closely with high school teachers and administrators to support secondary students in acquiring the technology skills prerequisite to college success. Specifically, they may want to develop a list of basic technology skills in specified applications that could provide prospective students with a clear list of expectations with regard to specific technology applications. Such a document might have multiple uses. For example, high school counselors could make the list available to prospective students so they might more strategically develop their technology skills. Second, such a document might also prove helpful to high school teachers and administrators who are responsible for planning and delivering technology courses and embedding technology skills across the curriculum.

Recommendations for Future Research

This study has implications for other researchers interested in studying the technology skill levels of college students. Additional research might be done by establishing focus groups and conducting in-depth interviews with students. It would be particularly interesting to develop a semi-structured interview protocol that would include questions as to the importance of technology skills and why students ranked certain skills as important prior to entering college.

In addition, the researcher is curious as to whether results might differ if the survey used in this study were administered to students enrolled in a distance learning course at Sinclair Community College. In a similar way, it would be interesting to see if the survey produced comparable or differing results when administered to students involved in an independent study course.

Another interesting area of investigation might relate to the researcher's earlier suggestion that the college may want to develop a technology skills assessment test. Developing, pilot testing, and examining the results of a pilot administration would provide important data on both the validity and reliability of the instrument, as well as preliminary insight into students' technology skills.

A third area of potential research might relate to a study that would explore the technology interests of academic deans, department chairpersons and faculty within academic divisions at Sinclair Community College. Data from such a study might provide prospective students with greater clarity on the technology skills necessary prior to entering a specific program at Sinclair.

Currently, Sinclair offers online courses to support technology skills development. For example, courses teaching computer keyboarding, word processing, spreadsheet, database, and presentation computer applications are taught by making use of the Internet and World Wide Web. Despite the results of this study, which suggest students do not prefer online classes to acquire technology skills, it would be interesting to conduct a study comparing the results of student learning and skills attainment in a technology skills course

completed in an online format versus a classroom setting. For example, it would be interesting to assess students' technology skill levels prior to completing an online course teaching technology and then reassess that same skill after completing an online course in order to determine the level of knowledge obtained in the online course. A comparison study could be conducted using a classroom setting and evaluating the level of knowledge obtained in a classroom setting. In addition, it would be interesting to survey students on the reasons they may choose a particular method of learning as preferred or not preferred.

Final Thoughts

Based on the findings in this research study, the researcher feels that additional research should be conducted to develop a better understanding of the impact that technology skills have upon the success of first-year college students. The results of this study indicate that students feel that a certain level of technology skills is important for a student to possess prior to entering college.

The researcher of this study feels very strongly about technology skills becoming more important in the next few years. As these skills become more prevalent, the researcher believes that students entering college should be assessed not only in the areas of English, reading and math, but also in basic technology skills.

It is the hope of the researcher that in some small way, this study will contribute to Sinclair Community College's effort in helping students be

successful in making the transition into college studies. Today, more than ever before, a successful transition is in part related to the technology skills students need to meet the demands of work and study in the twenty-first century.

APPENDIX

Technology Literacy Survey

1. I am in the following age category:
 - A. 20 or younger
 - B. 21-30
 - C. 31-40
 - D. 41-50
 - E. Over 50
2. I have completed:
 - A. 0-15 quarter hours/0-12 semester hours of college courses
 - B. 16-30 quarter hours/13-24 semester hours of college courses
 - C. 31-45 quarter hours/25-36 semester hours of college courses
 - D. 46 or more quarter hours/37 or more semester hours of college courses
3. How would you rate your overall technology skills?
 - A. Very strong
 - B. Strong
 - C. Average
 - D. Weak
 - E. Very Weak

Questions 4 through 9 are designed for self-assessment for each of the following technology skills. How do you rate your skill level in each of the following?

4. Word processing software (e.g. Microsoft® Word, Corel™ WordPerfect, OpenOffice Writer):
 - A. Very strong
 - B. Strong
 - C. Average
 - D. Weak
 - E. Very Weak

5. Spreadsheet software (e.g. Microsoft® Excel, OpenOffice Calc):
 - A. Very strong
 - B. Strong
 - C. Average
 - D. Weak
 - E. Very Weak
6. Presentation software (e.g. Microsoft® PowerPoint, OpenOffice Impress):
 - A. Very strong
 - B. Strong
 - C. Average
 - D. Weak
 - E. Very Weak
7. Database software (e.g. Microsoft® Access):
 - A. Very strong
 - B. Strong
 - C. Average
 - D. Weak
 - E. Very Weak
8. Email:
 - A. Very strong
 - B. Strong
 - C. Average
 - D. Weak
 - E. Very Weak
9. Internet and/or World Wide Web:
 - A. Very strong
 - B. Strong
 - C. Average
 - D. Weak
 - E. Very Weak

10. How did you acquire the technology skills you possessed prior to entering Sinclair Community College? (check all that apply)
- A. High school
 - B. Workshop
 - C. "How to" book or manual
 - D. Self-taught
 - E. Other

For questions 11 through 16, please rate each of the identified technology skills in terms of how important it is for students to possess prior to entering Sinclair Community College.

11. Word processing software (e.g. Microsoft® Word, Corel™ WordPerfect, OpenOffice Writer):
- A. Highly important
 - B. Important
 - C. Not important
 - D. Unsure
12. Spreadsheet software (e.g. Microsoft® Excel, OpenOffice Calc):
- A. Highly important
 - B. Important
 - C. Not important
 - D. Unsure
13. Presentation software (e.g. Microsoft® PowerPoint, OpenOffice Impress):
- A. Highly important
 - B. Important
 - C. Not important
 - D. Unsure
14. Database software (e.g. Microsoft® Access):
- A. Highly important
 - B. Important
 - C. Not important
 - D. Unsure

15. Email:
- A. Highly important
 - B. Important
 - C. Not important
 - D. Unsure
16. Internet and/or World Wide Web:
- A. Highly important
 - B. Important
 - C. Not important
 - D. Unsure

For questions 17 through 22, please rate each of the following methods in order of personal preference for acquiring technology skills.

17. Completing an online course:
- A. Highly preferred
 - B. Preferred
 - C. Not preferred
 - D. Unsure
18. Completing a technology skills course in a classroom setting:
- A. Highly preferred
 - B. Preferred
 - C. Not preferred
 - D. Unsure
19. Completing a technology skills workshop:
- A. Highly preferred
 - B. Preferred
 - C. Not preferred
 - D. Unsure

20. Completing a computer-based tutorial program:
- A. Highly preferred
 - B. Preferred
 - C. Not preferred
 - D. Unsure
21. Working alone with the guidance of a "how to" book or manual:
- A. Highly preferred
 - B. Preferred
 - C. Not preferred
 - D. Unsure
22. Teaching myself through exploration and experimentation:
- A. Highly preferred
 - B. Preferred
 - C. Not preferred
 - D. Unsure
23. Do you feel that a course teaching basic computer and technology skills should be required of students entering Sinclair Community College?
- A. Yes
 - B. No

Thank you for completing this survey.



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