A PHENOMENOLOGICAL STUDY OF DRAFTING TECHNOLOGY INSTRUCTORS FROM AN ONLINE PROGRAM OF STUDY IN A TECHNICAL COLLEGE SETTING

by

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(Under the Direction of Clifton L. Smith)

ABSTRACT

The purpose of this qualitative study was to describe the experiences related to the creation and maintenance of the online drafting program through the eyes of the drafting instructors involved. The phenomenological approach to qualitative inquiry as described by Patton (2002) and Merriam (2002) was used to guide this study. Interviews were conducted as the primary method of data collection and were considered the most appropriate method to describe the lived experiences of the drafting instructors. The three people that were directly involved in the creation and maintenance of the online drafting program served as the participants in this qualitative study. The researcher utilized the constant comparative method of data analysis. The major emergent categories from the data were rapid change, support, and freedom. There were two themes within each category as well.

The thick and rich descriptions of the experiences given by the participants allowed the researcher to describe the phenomenon of the online drafting program of study. The researcher used the ADDIE model as the conceptual framework in this study and found that the experiences were relative to the phases of this model. This was presented through discussing how the

emergent categories and themes from the data analysis were associated to each phase of the ADDIE model.

There were several conclusions drawn from the findings in this qualitative study. The findings suggest that the experiences of the instructors can give the reader several implications for practice, such as how important technology skills and technology support will be in order to create and maintain materials for online instruction. Other implications included the importance of administrative support and the ability of online education to solve time and distance barriers for students.

INDEX WORDS: Instructional Design, Phenomenology, Drafting, Career and Technical Education, Vocational Education, Online Education, Distance Education, Computer Aided Drafting, Technical College, Community College, Two Year College

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DEDICATION

This study is dedicated to my best friend and wife, Ivy, who has stood by me throughout the entire process from applying to graduate school until the day I finished the dissertation. I know how tired of proof reading she was by the time I turned in the final copy. There were also countless times during week nights and weekends that she took care of me when I was busy working on the dissertation. I can definitely say that I could not have done it without her love and encouragement.

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CHAPTER 1

INTRODUCTION

Background of the Study

The state of Georgia faced fiscal privation in 2009-2010 since the economy has been recovering slowly from a recession. This has meant measures to save money such as furloughs for state employees in Georgia. Many people that live in Georgia have faced layoffs and difficulty finding work as the unemployment rate is higher than the national average. This has given many people the opportunity to go back to school to learn new skills or to update old skills. The state has an affordable technical college system that has seen enrollment numbers rise during these years of the slow economy.

The Technical College System of Georgia (TCSG) is a 2-year higher education organization comprised of 33 colleges. The colleges in this system, like most 2-year postsecondary organizations and systems, have continued to serve students through a mission that includes vocational or technical education, developmental education, community education, and collegiate education. According to the Department of Technical and Adult Education website (n.d.) " The Technical College System of Georgia provides technical, academic, and adult education and training focused on building a well-educated, globally competitive workforce for Georgia" (Mission section, para.1).

Technical programs of study that range from certificates to degrees provide students with a broad range of career opportunities in technical fields. The system offers programs with standards created from business and industry requirements in the state of Georgia (TCSG, n.d.). Courses in the technical college system are delivered through traditional face-to-face instruction in a classroom, through online instruction outside of the campus (the student does not have to

come to campus), and through a hybrid mode of instruction where there is actual face-to-face instruction combined with online instruction that takes place outside of the classroom.

According to Burke (2002), schools similar to The University of Phoenix are putting pressure on the traditional colleges and universities to compete in the world of distance education. Verduin and Clark (1991) define distance education as "formal instruction in which a majority of the teaching function occurs while the educator and learner are at a distance from one another" (p. 13). The pressure on colleges to compete leads to increased online course and program offerings. However, there have been few industrial technology programs of study done totally online because of the need for hands on experience using high tech equipment such as in an automotive technology lab or in a machine tool technology lab. One of the few industrial technology programs of study that lends itself to all of the delivery methods is drafting technology.

The drafting curriculum heavily utilizes the computer and computer aided drafting (CAD) software programs (Bureau of Labor Statistics, 2010). AutoCAD, which is an example of a CAD software program, is free for students to download as an educational version if they have a school issued email address or when they are students of college programs that have a lease agreement with an Autodesk product (Autodesk, n.d.). Since expensive software is available at no cost, students will have one less barrier in front of them if they desire to take drafting as an online program of study. Autodesk is not alone in this endeavor to provide college students with free educational CAD software. Competitors such as SolidWorks have also provided their three dimensional parametric design program as a no cost student design kit available as a download when the students purchase the textbook (SolidWorks, n.d.).

Drafting programs of study in the TCSG are offered through degree, diploma and technical certificates of credit (TCSG, n.d.). The technical certificates of credit consist of mostly drafting courses and require fewer total credit hours to complete compared with the degree and diploma in drafting. Both the degree and diploma in drafting combine drafting courses with general education courses to complete the program of study. This is a typical format that most colleges utilize nationwide (Bureau of Labor Statistics, 2010).

The general education courses that are required for the drafting programs of study, like all programs of study in the TCSG, are actually offered online through the Georgia Virtual Technical College (GVTC) in addition to being offered at the individual colleges in various formats (GVTC, n.d.). This system allows students at any technical college in Georgia to be able to take any general education course any quarter as a transient student. This is particularly helpful when courses at the home college of the student are not offered every quarter. This additionally allows students to be able to take more coursework online; thus saving gas and travel time for the student.

To become equipped with the necessary expertise in technical drawing, students in drafting programs of study are taught mainly in the traditional face to face format in the TCSG. There is some variation to this traditional method of teaching that is being utilized in Georgia however. Some colleges have started to utilize hybrid courses, which is a mixture of a traditional format of face to face instruction with online instruction. There is additionally one college that has the entire program of study online.

There have always been conflicting arguments both for and against online course work, but most of the research only compared the final grade at the end of the courses. Russell's (1999) work laid the foundation for this type of research since he reviewed over 355 studies that were

done from 1928 to 1998. A "no significant difference" phenomenon is what Russell called his findings from reviewing the research studies. His research concentrated on the comparison of distance education course work with traditional classroom coursework. Even after Russell's "no significant difference" phenomenon, the online delivery has been critiqued for being a less rigorous version of the traditional format. However, White (1999) made the argument that dreadful instruction can be found in both the traditional classroom and the web, just as brilliant instruction can also be found in both places. The instructor is the driving force behind the delivery; therefore the delivery method is merely the tool by which the information is given to the student.

Students have had input into the conversation about course delivery preference. Black (2001) conducted a survey of one hundred and sixteen students to "assess their perceptions of traditional (classroom courses), online (Internet courses), and hybrid (a combination of classroom and Internet) modes of course delivery" (p. 1). The results indicate that hybrid course delivery is favored according to Black. This makes sense given that hybrid combines the advantages of traditional and on-line delivery modes. Bleed (2001) believed that the cost-effective nature of this system can save institutions money through using half of the space and time for instruction. Bleed also pointed out that the students would save time and commuting costs.

Wyatt (2005) conducted research in order to measure student opinions of on-line instruction, specifically in satisfaction with academic rigor and interaction. Using a questionnaire style survey, Wyatt found that "The majority of students reported that online instruction provided a quality academic experience and that online instruction is more academically demanding than traditional classroom instruction" (p. 1). Wyatt believed that like

any method of instruction, online delivery does not meet the needs of all learners. There is not one perfect method that is for every learner. In another study, Warren and Holloman (2005) found similar results to that of Wyatt's. The study compared data from a traditional classroom course and the on-line version of that same course. A comparison of student outcomes and quality of instruction was the main focus of the study. "The results of this study are encouraging in supporting distance education as providing educational opportunities for an ever-increasing diverse and mobile society" (Warren & Holloman, p. 150).

Online courses are not a new idea in the TCSG, but most of the online courses are overwhelmingly lecture based courses which have been converted to the online environment. For example, the student taking English needs a computer and software to complete the assignments. However, the student taking a machine tool course would need a lathe or mill to complete assignments. This is true for most industrial technology programs such as welding, automotive, heating and air, and industrial maintenance. This could be one reason courses taught online are mostly lecture based; they do not require expensive equipment for the student.

Drafting Technology is offered as an online program of study through one of the colleges in the TCSG. This program of study seems to fit a similar requirement of computer and software to that of the English course mentioned earlier. However, according to Meyer (2002), "It is irrelevant to speak of the effects of using the Web without understanding how it is entwined with instructional design and especially faculty choices about instructional design" (p. 19).

According to Zirkle (2004), studies on distance education with regard to faculty use in the field of career and technical education are scarce and have yet to focus on programs instead of individual courses. "Research on distance education in career and technical education has been limited, despite recommendations for research direction more than two decades ago"

(Zirkle, p. 2). This points to a need for research as there is a gap in the literature in online coursework with respect to instructional design in career and technical education.

Statement of the Problem

Increased numbers of online courses and programs across the nation have resulted from pressure to compete in the distance education market (Burke, 2002). The problem this study aimed to address is the lack of distance education research in career and technical education. The research is needed for instructors to utilize as they attempt to address the pressure that colleges face to provide online education. How faculty make choices when designing distance education curriculum in career and technical education was specifically addressed in this study. Zirkle wrote, "There have been very few studies in career and technical education on faculty use of distance education" (2004, p. 7). One such program that has been offered online in the TCSG is drafting. Drafting is an industrial technology program that lends itself to online learning since it only requires a computer with computer aided drafting (CAD) software installed to complete hands-on lab projects. Since this in depth study of the online drafting program has been completed, it is the hope of this researcher that others might gain insight from the experiences of this pioneer program.

Purpose of the Study

The purpose of this qualitative study was to describe the experiences related to the creation and maintenance of the online drafting program through the eyes of the drafting instructors involved. The phenomenological approach to qualitative inquiry as described by Patton (2002) and Merriam (2002) was used to guide this study. The phenomenon that was studied in this research was the online drafting program at ABC Technical College in Georgia. ABC Technical College is a fictional name of one of the technical colleges in the state of

Georgia. Patton indicates that a phenomenon could be the focus of an emotion, a job, or even a program. One key to researching from a phenomenological point of view is describing how those involved directly experienced something first hand (Patton). This provides the researcher with the lived experiences and feelings which include how the drafting instructors make sense of the phenomenon under study. This was done by interviewing the instructors to elicit their stories of how the instructional design process worked for them. The completed study yields literature on the subject of online instructional design in the area of career and technical education.

Online coursework may be the only avenue for many students to become prepared to enter the workforce in Georgia as time and financial constraints could prevent many from attending college in the traditional face to face format. There is clearly a practical and theoretical need for research in the area of online career and technical programs of study with regard to instructional design (Meyer, 2002; Zirkle, 2004).

Research Questions

The study addressed the following research questions:

1. How do the drafting instructors of the online drafting program describe their experiences when designing instruction for an online drafting program in a technical college setting?
2. How did the lived experiences of the drafting instructors relate to instructional design processes in the development of the online drafting program?

Conceptual Framework

The phenomenological approach was used as the method of qualitative inquiry since the purpose of the study was to describe lived experiences. This method was used with a conceptual framework in order to answer the guiding research questions. This was accomplished by using the conceptual framework as a cross-referencing tool that ran in the background of the study as

the researcher developed interview questions, completed interviews, and analyzed data. In other words, the conceptual framework was constantly working to inform the study as the researcher used an instructional design perspective or viewing lens from beginning to end.

Smith and Ragan (2005) defined instructional design as the process of systematically developing instructional specifications that are used in the plan for delivering instruction. Instructional design utilizes learning and instructional theory to provide quality of instruction, which includes the creation of materials and activities that promote learning as well as informational resources and evaluation (Smith & Ragan). It is necessary to have a framework to guide the development of curriculum. According to Gagne, Wagner, Golas, and Keller (2005), instructional systems design (ISD) is the systematic and scientific process for creating instructional systems.

ADDIE is a generic term that generally is used as an acronym to represent the ISD process: Analysis, Design, Development, Implementation, and Evaluation (Molenda, 2003). ISD models, such as ADDIE, can incorporate any learning and instructional theories that the designer chooses (Gagne et al., 2005). The ISD model is merely the vehicle in which the learning environment and processes can become successful. The ADDIE model was chosen by the researcher to use as the conceptual framework for this study in order to have specific criteria to put side by side against the described experiences of the instructors.

This conceptual framework was used in conjunction with the phenomenological method of qualitative inquiry. This provided the means by which the problem, purpose, research questions, and design of the study were addressed. The ADDIE model used as a conceptual framework allowed the researcher to describe the lived experiences of the participants using phenomenological methods while viewing those experiences through the lens of an ISD model.

Each experience described by the participants was cross-referenced with each phase of the ADDIE model to discover if any relationship to instructional design existed; thus giving the researcher the information to properly answer the second research question.

The analysis phase of instructional systems design allows the designer to put together a needs assessment from the perspective of the instructor and the learner. This would include typical needs such as learning objectives, materials, and methods. Smith and Ragan (2005) write that "It is critical that designers consider their target audiences, as this knowledge will be important in designing instruction that is effective and interesting to others" (p. 58). Gagne et al. (2005) describe the analysis phase as a set of four levels which are to include such considerations as the purpose of the course, the target goals of the course (cognitive, affective, and motor skills), entry skill requirements, and constraints. It should be noted that this important phase of analysis directly feeds the next phase, which is the design phase.

The design phase is where the instructor creates the lesson plan which typically includes the topics that will be covered in the particular lesson or course. For example, the instructor will plan the information to be covered based on what was found in the analysis phase. According to Allen (2006) "Existing instructional materials are reviewed during this phase to determine their applicability to the specific instruction under development" (p. 436). Gagne et al. (2005) likens the design phase to the blueprint that an architect creates for a building. Although the architect has not actually built the structure, he has considered the needs and goals and put forth a plan (Gagne et al.). Just as the analysis phase directly feeds the design phase, the design phase directly feeds the development phase.

The development phase includes the responsibility of actually creating the materials that will be utilized in the course. This information of course is based on what was completed in the

design phase of the process. “If the media selected in the design phase included such items as videotapes, sound and/or slides, interactive courseware (ICW), and training devices, these are developed” (Allen, 2006, p. 437). Depending on the situation, materials may already be developed that will suit the design of the course. In such cases, the designer must determine how and what of the existing materials will work and if new materials need to be developed to accompany the existing materials (Gagne et al., 2005). Delivery systems must also be considered in the development phase. Gagne et al. warn that using existing materials when changing delivery systems can have unintended consequences. A primary example is when the same materials are used for both the traditional format course and the online format course when additional materials such as audio or video may have been needed to replace important lecture time from the traditional course (Gagne et al.). Once the development phase is complete, the implementation phase has the necessary information and materials to start.

The implementation phase is where the instructor gets to actually test the hard work that has led up to this phase. There are two different ways to implement this phase however. “The first refers primarily to implementation activities that occur while the course is still being created and evaluated, and is usually called pilot testing or field-testing” (Gagne et al., 2005, p. 34). The students will of course be the ones that will most likely put the materials and methods to the test in the second method. This is typically the case when the course is perceived to be ready to be “launched” (Gagne, et al.). The implementation phase then feeds the final phase of evaluation.

The evaluation phase is looked upon by some as a phase that can be a started as early as the first phase of analysis and utilized in every single phase (Allen, 2006). In this point of view the entire process is in a state of continuous changing and adapting to better meet the needs of the learner and instructor. Another point of view is that the evaluation phase is simply the last

phase of the ADDIE model and "This placement reflects its logical function as the point at which you determine whether your proposed solution to a problem has succeeded" (Gagne et al., 2005, p. 35). The evaluation can then be utilized to make improvements if it is determined that improvements are indeed required.

This conceptual framework was utilized to help the researcher in the qualitative study of the online drafting program through keeping the focus of the study in the necessary viewing lens. Since the purpose of the study was to describe the experiences of the drafting instructors in order to address the problem of the study, the conceptual framework helped the researcher to organize the lived experiences of the participants into common aspects of instructional design.

Significance of the Study

This researcher was unable to locate any research that has been done on online programs of study in drafting technology that related to faculty choices and experiences. Additionally, pressure from universities such as the University of Phoenix to compete in the distance education market is a reality (Burke, 2002; Meyer, 2002). This study contains significant research that informs instructional design practice and theory of online program development for higher education, specifically in technical programs of study such as drafting. By providing instructors with specific knowledge in regards to an in depth study for online drafting coursework, it is plausible that they may be better informed about what they can do to create or improve their practice of web based course work. According to Meyer "Whether it is federal government or state governments, accrediting associations or students, all stress the need to have a better understanding of what contributes to quality in on-line learning" (p. 1).

This study contributed literature to the insufficient body of research on technical programs of study in the area of instructional design. According to Zirkle (2004) "more research

needs to be conducted to determine the most effective ways to utilize distance education in the delivery of career and technical education programming" (p. 9). The study actually provided a practical example of how instructional systems design models, such as ADDIE in this case, can be used to categorize the experiences of the instructors of an existing online program and help to generate the information needed to understand how distance education can be utilized to deliver career and technical education. This study could be beneficial for students, educators, and administrators of career and technical education.

CHAPTER 2

LITERATURE REVIEW

Introduction

The purpose of this qualitative study was to describe the experiences related to the creation and maintenance of the online drafting program through the eyes of the drafting instructors involved. This chapter contains a literature review of background information in (a) the two year college, (b) career and technical education, (c) the Technical College System of Georgia, (d) drafting technology, and (e) Instructional Systems Design and ADDIE.

The Two Year College

The mission and purpose of two year colleges and community colleges have had some changes throughout their history, but support for these institutions has been consistent dating back to the 1960s. Individual states supported publicly funded two-year colleges and technical colleges dating back to the 1960s, in part because of "the federal Higher Education Act of 1965, which directed the states to create higher-education coordinating commissions if they wished to qualify for various federal aid programs" (Cohen, 2001, p. 10-11). According to Cohen, the rationalization for such state support came through emphasis on preparing the state's workforce and allowing for equal opportunity for the people.

Another notable influence for states to support two-year colleges was "that several prominent nineteenth and early twentieth-century educators wanted the universities to abandon their freshman and sophomore classes and relegate the function of teaching adolescents to a new set of institutions, to be called junior colleges" (Cohen & Brawer, 2003, p. 6). In this manner, the upper level studies could be left to the most prestigious universities and the basic level studies could be given to the two-year colleges. This also allowed the two-year colleges to serve

as a system of taking the students that were not considered the best college students while the flagship state university could directly accept the brightest students directly from high school or the students that excelled in the two-year college.

There are also more factors that contributed to the evolution of the two-year college, especially with respect to state support of publicly funded community colleges. "Until the 1900s, two essential components were not yet in place: sizable numbers of students graduating from high school and public school districts managing secondary schools to which they could readily append two or more years of curriculum, with or without special legal sanction" (Cohen & Brawer, 2003, p. 11). The sheer number of students attending secondary schools created a boom in high school graduates, which in turned led to demand like never before seen for higher education (Cohen & Brawer). These numbers grew as a result of more and more states passing child labor legislation which allowed more young people to stay in school and actually finish it (Cohen, 2001). Since the public school districts had the authority to act on their own, adding two more years of education to satisfy this demand was well within their power.

The two-year postsecondary institutions have continued to serve students through a mission that includes vocational education, developmental education, community education, and collegiate education. Not every two-year post secondary institution will carry out all of these functions; however, the majority will attempt all of these areas. The vocational education mission is particularly important to the workforce of our nation. According to Cohen and Brawer (2003) "There can be no reversing the perception that one of the colleges' prime functions is to train workers, and ample funds are available to support this function" (p. 420).

The importance of developmental or remedial studies as it is sometimes referred to, remains extremely important. The fact that students are not always prepared to enter a post-

secondary program of study upon graduating from high school is only one of the factors that keep developmental education growing throughout two-year institutions. Cohen and Brawer (2003) report that "A sizable amount of basic skill development would continue to be necessary for many years merely to accommodate the backlog of functionally illiterate and non-native-English-speaking people in America" (p. 422).

Community education is also a mission objective for many two-year institutions throughout America. Community education comes in all shapes and sizes at these institutions. One aspect of community education is that of specialized training programs for local industry. Local industry actually takes on a contract with the local college to train employees in something such as programmable logic controllers, for example. On the seemingly opposite end of the spectrum are the continuing education courses that are for personal enrichment, such as yoga courses and basic computer courses. The courses offered under the community education umbrella can obviously be a very serious investment for local industry, or a fun adventure for people of the community.

The mission objective of collegiate education is the last, but certainly not least function of the 2-year college. Cohen and Brawer (2003) wrote that this function is one that will thrive due to the occupational programs that require what is typically known as general core curriculum, such as mathematics and English. Thus the collegiate education aspect works to help provide the academic core for vocational or technical programs, while giving students credits that are transferable towards bachelor's degrees. However, trends towards a more focused workforce education system indicate that traditional liberal education courses will fade in importance at the 2-year college (Higginbottom & Romano, 2001).

Career and Technical Education

Career and technical education has been a major component of the two year college and has had the need for proper funding since its infancy. As early as the 1820s apprenticeship programs and trade schools were being utilized to prepare people to enter the workforce (Hall & Marsh, 2003). It is an injustice to review career and technical education without an understanding of how federal legislation influenced its development and role. The early legislation included the first Morrill Act of 1862, the Hatch Act of 1887, the Morrill Act of 1890, the State Marine School Act of 1911, and the Smith-Lever Act of 1914. The Smith-Hughes Act of 1917 came shortly after the Smith-Lever Act and is the best known major federal legislation that aimed to help career and technical education (Hall & Marsh).

According to Hall and Marsh (2003) "The Smith-Hughes Act established federal, state, and local agency partnerships for career and technical education" (p. 133). This act helped to build the foundation for career and technical education. The act by congress called for separate funds to be used strictly for vocational spending such as for teacher salaries. This foundation allowed for legislation such as the Carl D. Perkins Act.

Perkins was a firm believer in vocational education and the implications it could have on American life. The same year that Carl D. Perkins died, the Carl D. Perkins Vocational Education Act of 1984 passed. The Perkins Act did not die out and go away after a few years like some of the other federal education programs. "On September 25, 1990, the Carl D. Perkins Vocational and Applied Technology Act Amendments were signed into law" (Hall & Marsh, 2003, p. 135). Not even a decade later another version of the Perkins Act came into effect called the Carl D. Perkins Vocational and Technical Education Act of 1998. Each time the Perkins Act changed, it increased in funding allotment and created more accountability measures on the part

of the individual states that used the federal dollars. More specifically on the individual institutions that applied for the Perkins funds.

The compromising process by which the original policy was developed in 1984 would accomplish a social goal as well as an economic goal. The House and the Senate had two differing viewpoints on the focus of the Perkins Act. "The House wanted improvement, modernization, and expansion of vocational education programs while the Senate version placed more emphasis on the social aspects, with provisions to provide more and better services for special needs" (Israel, 1995, p. 46). While the two did compromise to eventually pass the Perkins Act, the compromise did not weaken the social or economic goal. In fact, the combination of those two differing goals represents what the culture of the United States had been trying to do with equal rights laws and workforce preparation for decades. The Perkins Act truly would revolutionize vocational education. The community colleges in the United States saw a large increase in special populations that enrolled in occupational programs. Special populations was defined as the following: "Under the law, special populations include individuals who are: living with disabilities; from economically disadvantaged families, including foster children; preparing for non-traditional fields; single parents, including single, pregnant women; displaced homemakers; or challenged by limited English proficiency" (Rubenstein & Mayo, 2006, p. 48).

The impact of the Perkins Act on workforce issues and preparation came in the form of increased special populations in the occupational programs at community colleges as well as an overall increase in occupational programs offered at community colleges while increasing the quality of career and technical education for the purpose of increased workforce readiness. "A national study done in response to Perkins legislation reported that 43 percent of the total

community college student population and more than half of the disadvantaged and disabled students were enrolled in vocational education programs" (Cohen & Brawer, 2003, p. 228). The fact that more people were actively participating in vocational programs created an increase in prepared workforce populations. Most jobs that were available and still are available are jobs that did not and still do not require a bachelor's degree, but require more than a high school diploma.

The latest version of the legislation is called the Carl D. Perkins Career and Technical Education Act of 2006. This legislation has an increased focus of academic achievement for career and technical education students (U.S. Department of Education, 2006). Additionally, a stronger connection between secondary and post secondary schools must be made as a part of this package (U.S. Department of Education). Articulation agreements and dual enrollment programs that already exist will likely become stronger as a result of this legislation. The Perkins Act gives the community colleges as well as the secondary schools funding that in turn should help the students become active members in the nation's workforce by exposing the students to quality career and technical educational opportunities.

The strong commitment to quality career and technical education that the Perkins Act pushes is in response to the calling of a quality workforce by the American industry. The Association for Career and Technical Education believe "The purpose of Perkins is to provide individuals with the academic and technical skills needed to succeed in a knowledge- and skills-based economy" (ACTE, n.d., para.1). High-tech jobs require qualified persons to fill those jobs and the Perkins Act leads our students in that direction.

Career and technical education has grown from its early days of being primarily an agricultural function. Career and technical education now brings high-tech careers to the minds

of those that search in an educational institution. The funding stream that the Perkins Act and other federal and state grants provide career and technical education creates better opportunity for the students through access to industry standard equipment and facilities. One such example in Georgia is the Technical College System of Georgia (TCSG).

Technical College System of Georgia

The TCSG has over 30 colleges that provide high-tech educational opportunities to the people of Georgia. Career opportunities in fields such as robotics and programmable logical controllers are only two of the many programs of study offered in the TCSG. The history and evolution of the Technical College System of Georgia came about as a direct result of the state's need for a skilled workforce. Early legislation such as the Smith-Hughes Act of 1917 helped to lay the foundation for the evolution. The senator of Georgia at that time was Hoke Smith. Smith co-sponsored the Smith-Hughes Act of 1917 as well as the Smith-Lever Act of 1914, which was known as the Agricultural Extension Act (Hall & Marsh, 2003). According to Breeden (n.d.) "In 1943, Dr. M.D. Mobley, then the State Director of Vocational Education, succeeded in getting the State Board of Education to approve his recommended plan for a system of Area Trade Schools, and by 1944 the first school opened in Clarkesville—North Georgia Trade and Vocational School" (p. 3).

The name had not officially changed to the TCSG yet, but a system of area trade schools gave the state a much-needed avenue to educate and train the people of Georgia to enter the workforce in agricultural and industrial fields. A few years after the fist school opened in Clarkesville, the opening of another trade and vocational school opened in Americus in South Georgia. This process increased with more school openings when W.M. Hicks, the State Supervisor of Trade and Industrial Education in the 1950s, realized that the system needed to

grow to meet the increased demand for education (Breeden, n.d.). The schools began to be called Area Vocational-Technical Schools by the late 1950s and had grown to 19 schools spread throughout Georgia by the 1960s (Breeden).

Next, According to Breeden (n.d.) "The growth continued, and soon another major landmark was reached in 1984 when Governor Joe Frank Harris created the State Board of Postsecondary Vocational Education, which ultimately led to the creation of the Department of Technical and Adult Education in 1988" (p. 3). The same year that the Department of Technical and Adult Education (DTAE) was created the umbrella expanded to include the state's adult literacy program. This addition, along with the Quick Start program, gave the system a powerful and important mission. "For the first time in Georgia history, a state agency was now dedicated to the full scope of workforce development services- literacy, technical education and economic development" (Breeden, p. 3). Since then, the organization has grown to 34 technical colleges and utilized federal and state grants to modernize facilities and educate students with innovative technological programs of study.

The vision, major purposes, and significant directions for 2010 of the TCSG are built into the mission statement of the organization. According to DTAE (2006) "The mission of the Technical College System of Georgia is to contribute to the economic, educational, and community development of Georgia by providing quality technical education, adult literacy education, continuing education, and customized business and industry workforce training to the citizens of Georgia" (para.1). Included in the vision of the organization is the ease of transfer of credits from one educational institution to others, including technical colleges and university system colleges. The vision also includes innovative technology and resources that help to put Georgia's economy in the global market (DTAE). The significant directions for 2010 include a

continued interest in partnership development with industry and include educational and training programs and strategic alliances to help Georgia's economy and communities (DTAE). As of 2008, the system officially changed its name to the Technical College System of Georgia to reflect a unified system.

The TCSG has a great history and a strong mission statement that continues to help the citizens and industry in Georgia. The system of colleges in Georgia is a viable option for students as it is actually affordable. "Georgia's technical college tuition has been and will continue to be one of the lowest among southern states" (Jackson, 2007, para.3). There are a plethora of innovative and high-tech programs of study for students to enter, however one of the oldest programs of study has gone from basic manual drafting tools (compass, protractor, and paper) to high-tech 3-D modeling using software and rapid prototype machines. This program is drafting technology.

Drafting Technology

Drafting curriculum has evolved rapidly since the introduction of computer aided drafting (CAD); however it continues to serve the same basic role at the collegiate level. Industrial technology fields such as engineering, manufacturing, and construction related fields all share at least one core area of study, which is drafting based. The importance of this role actually seems to grow as CAD programs become more powerful every day.

The role of drafting curriculum at the collegiate level seems to be that of a foundational role for engineers and architects, while it is more of the main focus in the two-year college for students that major in drafting. According to Frey and Baird (2000) "technical graphics permeates nearly every aspect of industry" (p. 2). This is a very strong statement that indicates how important drafting curriculum should be to college level programs of study that relate to

industrial technology fields such as engineering, manufacturing, and construction. Students that study such areas need to be able to understand and visualize objects such as mechanical parts or bridge trusses. "Improving the ability of students to visualize the product depicted on a drawing in its completed form is one of the primary purposes of design and drafting curricula" (Frey & Baird, p.2). This ability is known as spatial visualization. This term defined "is the ability to manipulate an object in an imaginary 3-D space and create a representation of the object from a new viewpoint" (Strong & Smith, 2002, p. 2).

The scope of drafting curriculum at the collegiate level is often dictated by the needs of the program of study. Since a bachelor's degree in drafting related fields such as engineering and architecture only focus a small part of the program of study on actual drafting coursework, a drafting degree is typically found at the associate degree level. This is unfortunate for rookie engineers and architects since they tend to do much drafting work under the supervision of senior level engineers and architects. Giesecke, Mitchell, Spencer, Hill, Dygdon, and Novak (2003) add that "furthermore, the engineering student is apt to overlook that, in practically all the subsequent courses taken in college, technical drawings will be encountered in most textbooks" (p. 9).

These drafting associate degree programs are located at community and technical colleges such as in the TCSG. The associate degree programs that concentrate on drafting prepare students for careers in which they would create the drawings for engineers, architects, and other industrial technology designers. The drafting degree does not cover engineering design and analysis, or any of the calculus based strength of materials coursework that engineers have to learn. The drafting majors learn more of the technique and skill that is required to produce drawings that are used in the industrial technology fields such as engineering, construction, and manufacturing.

The drafting programs that are located throughout the TCSG all have at least one thing in common; state standards in the curriculum. Like all programs and courses in the technical colleges in Georgia, drafting programs and courses must meet state standards and cover certain competencies. Regardless of online or traditional format, the standards must be followed to ensure accountability, consistency, and quality. According to TCSG (n.d.), "Curriculum standards have been developed with direct involvement of business and industry" (para.1).

Each program is required to maintain an advisory board made up of members that work in the field of the program. A drafting program advisory board will include members from construction, engineering, and manufacturing areas that work directly with or supervise drafters or designers. The function of these field experts is to provide input to the program director in order to keep equipment and curriculum in sync with industry standards.

The drafters that graduate from the community and technical colleges will work closely with the engineers, architects, and other industrial technology designers (Bureau of Labor Statistics, 2010). This means that engineering based collegiate curriculum will have courses in drafting graphics as well as blueprint reading, thus allowing the engineers to be able to read and understand drawings that are used in the work place. This also allows the engineer the ability to work with the drafter and easily communicate what is needed to the drafter. Typically, designers such as engineers and architects will communicate a design with the drafter and then sign off on the final drawing that is created by the drafter. According to Giesecke, et al. (2003) "Engineers and designers must be able to create idea sketches, calculate stresses, analyze motions, size parts, specify materials and production methods, make design layouts, and supervise the preparation of drawings and specifications that will control the numerous details of product manufacture, assembly, and maintenance" (p. 2).

The work of a drafter can be quite time consuming and very tedious (Bureau of Labor Statistics, 2010). The designer is sometimes running several design projects that require many drafters to complete the necessary drawings. This allows a company to save money since engineers require a larger pay rate than drafters require due to responsibility and education levels. In either case, whether drafter or engineer, the graphic language is heavily utilized in industry. An understanding of the graphic language of drafting through both manipulation and creation of drawings should be the essential role of collegiate curriculum. According to Giesecke et al. (2003):

> The engineer and drafter for the twenty-first century must understand how to read and write in the graphic language. Everyone on the engineering and design team must be able to communicate quickly and accurately in order to compete in the world market. Like carpenters learning to use the tools of their trade, engineers, designers, and drafters must learn the tools of technical drawing. (p. 1)

The tools of technical drawing are very dependent on software, especially software that has three-dimensional (3-D) capabilities. The debate that many colleges seem to still wrestle with is the direction of the drafting program in terms of utilizing a 3-D based instructional methodology versus a two-dimensional (2-D) based instructional methodology. A primary role of technical and community colleges is to provide industry with qualified people for employment.

Historically, there seem to be a few reasons that colleges have resisted changing from 2-D to 3-D. Cost seems to be the most common reason that colleges have not gone to full blown 3-D systems software. There are software programs available that can cost over ten thousand dollars and smaller colleges and departments would struggle to make such a large investment

(Branoff, Hartman, & Wiebe, 2002). However, the cost has dropped over the past several years and software is more affordable than ever. Branoff et al. also report that "Another excuse for not revising the curriculum has been that students must understand 2D geometry before entering the 3D environment", however "no studies have been conducted to suggest that this is true" (p. 5).

According to Walker and Cox (1999) the trend of availability in computer systems that are both powerful and affordable has allowed for great parametric software programs to actually work on a computer that did not cost too much. The amount of time that can be saved by using 3-D software is astonishing. In the past, an engineer was required to perform an analysis on the part being developed to determine the mass properties, such as its strength in tension and compression, however the parametric CAD programs now have such analysis capabilities built in for use by the designer (Reifschneider, 2000). Reifschneider adds that "The use of such analysis programs by product designers is one of the latest developments in the time compression trend within manufacturing" (p. 2).

The 3-D software available today can create the necessary 2D drawings as well as solid models needed for production and can be used for creation of rapid prototypes as well. "For example, a simple part that is to be mass manufactured without additional testing and analysis can be drawn quickly as a 2-D multiview drawing"; however, " a prototype design of a new component that must be analyzed and tested might best be developed as a 3-D solid model" (Madsen, Madsen, & Turpin, 2007, p. 60). Madsen et al. (2007) wrote that rapid prototyping is a time saving manufacturing process that allows a model of a part to be quickly created by a machine that reads information from a CAD file without additional tooling. Also known as stereolithography and 3-D printing, this process creates solid models from analyzing sliced layers from the CAD file (Madsen et al.). The process is called rapid prototyping because of the

vast difference in time that is spent creating the prototype when compared to machining a prototype from metals the traditional way.

3-D printers are becoming more popular in drafting and engineering departments at colleges nationwide since the cost has dropped significantly over the past few years. For example, Dimension is a company that has sold many such machines in the state of Georgia to universities and colleges. "Dimension 3D Printers are helping high schools, technical colleges and universities extend their science, CAD and machine tool curriculums by enabling students to build functional 3D models and see their ideas firsthand" (Dimension, n.d.,para.4). These 3-D printers and other rapid prototype machines that industry and education are utilizing use only 3-D CAD files; thus creating more of a demand for 3-D software.

Published literature on the use of rapid prototyping in educational programs also supports the 3-D argument. According to Stier and Brown (2000-2001) industrial programs need to have an increased focus on rapid prototyping as a part of their curriculum in order to satisfy the requirements of industry. Others in the field of industrial technology seem to encourage the use of rapid prototype machines in the educational programs as well. Parts can be complicated and impossible to model, however the process of rapid prototyping allows the teachers and learners to create models of these parts that have traditionally not been possible to model (Frey & Baird, 2000). Additionally, Frey and Baird indicate that students can now make physical models of parts that they possibly designed, instead only making copies of existing parts.

The first CAD programs allowed drafting to become faster and automated, however solid modeling and rapid prototyping have made it possible for the production process to be affected in a positive way (Giesecke et al., 2003). The advantages in analysis and testing of materials and designs within the 3-D environment are truly a time and money saving feature that cannot be

ignored. The added bonus of utilizing rapid prototype machines that directly read the 3-D CAD files also add to the 3-D revolution that has taken over industry and education (Madsen et al., 2007).

Since the drafting programs in the TCSG all share the same state standards and have access to affordable CAD programs that have 3-D capabilities, it is safe to assume that the reality of the 3-D debate lies with the individual colleges and the needs of the service area. As previously mentioned, the advisory boards that the programs maintain inform the program director of their needs in order for the graduating students to be prepared to enter the work force in the local service area (TCSG, n.d.). This means that if the advisory board needs more 3-D skill, then the programs will incorporate those needed skills into the program by either modifying the assigned lab projects to cover both the state standards and the 3-D applications or the process of revising state curriculum to further include more of industry standards can be started through the consortia level (TCSG, n.d.).

The drafting instructor must be able to incorporate the desired skills into the drafting program in order to meet the needs of the service area. In order to do this, the instructor must have an understanding of the methods and materials of teaching and designing the appropriate level of coursework. There a number of different teaching philosophies, methods, and instructional systems design models available to the instructor.

Instructional Systems Design and ADDIE

In the late 1960s, early ISD models came about as the result of military training research that focused on the creation of technical training programs (Allen, 2006). The military is not the only organization interested in using systematic training programs. Large business corporations, school systems, and even professional athletics all utilize training in a systematic fashion.

According to Allen "The most widely used methodology for developing new systematic training programs is often called instructional systems design (ISD)" (p. 430). Gagne, Wagner, Golas, and Keller (2005) state that ISD "is both systematic and scientific in that it is documentable, replicable in its general application, and leads to predictable outcomes" (p. 18).

The most commonly known model of ISD is ADDIE (Dick, Carey, & Carey, 2005; Gagne et al., 2005; Molenda, 2003; Smith & Ragan, 2005). The acronym ADDIE stands for the most common phases involved in instructional systems design, which are Analyze, Design, Develop, Implement, and Evaluate.

A simple Google search on of "ADDIE" (July 31, 2008) returned about 4 million hits. These hits ranged from summaries of the model to businesses that wanted to offer services to design training for institutions or individuals. Literature available on the ADDIE model includes businesses and individuals that claimed to use the ADDIE model to execute a specified goal. One such example is using the model to improve the cataloging department at a university library. At the Ohio State University library, the cataloging department started to receive complaints about the slow process and wasted time that it took to find materials that were unprocessed (McGurrr, 2008). McGurr indicates that "Unlike popular reorganization plans, such as Six Sigma (developed by Motorola as a process improvement technique), the ADDIE model is not copyrighted or trademarked; therefore it is an inexpensive and flexible model to use and adapt" (p. 55). McGurr admits that part of the reason the department used the ADDIE model comes from her experience as an instructional designer and college professor (McGurr).

Lohr (1998) also has added to the literature on the ADDIE model by providing her experience of designing a web-based training interface. Lohr's paper provides the breakdown of what happened during the five phases of the ADDIE model. For example, during the

implementation phase Lohr reports that “Individual users will be asked to think aloud while working through the Corporate Course Design interface” (p. 6).

The literature also indicates that ADDIE is not an actual model at all, but rather a generic label for the process of designing instructional systems. Molenda (2003) contends that after exhaustive research on the actual origin of ADDIE that:

> I am satisfied at this point to conclude that the ADDIE model is merely a colloquial term used to describe a systematic approach to instructional development, virtually synonymous with instructional systems development (ISD). The label seems not to have a single author, but rather to have evolved informally through oral tradition. There is no original, fully elaborated model, just an umbrella term that refers to a family of models that share a common underlying structure. (p. 1)

Others agree with Molenda’s point of view. Bichelmeyer (2004) indicates that “One might also think of it as a conceptual framework for instructional design, a mental frame of reference that loosely guides instructional designers as they attempt to approach instructional design problems in a systematic way” (p. 5).

In summary of the ADDIE model, it seems as though some actually use it as an ISD model to solve problems and create training or courses whereas others tend to think of it as a conceptual framework. Its phases of analyze, design, develop, implement, and evaluate can surely provide the instructional designer with a structured system. In this case, it has been used by the researcher as a conceptual framework as the drafting instructors discussed their lived experiences in the creation and maintenance of the online drafting program.

This conceptual framework was used in conjunction with the phenomenological method of qualitative inquiry. This provided the means by which the problem, purpose, research

questions, and design of the study were addressed. The ADDIE model used as a conceptual framework allowed the researcher to describe the lived experiences of the participants using phenomenological methods while viewing those experiences through the lens of an ISD model. The experiences described by the participants were cross-referenced with each phase of the ADDIE model to discover if any relationship to instructional design existed.

This chapter contained a literature review of background information in (a) the two year college, (b) career and technical education, (c) the Technical College System of Georgia, (d) drafting technology, and (e) Instructional Systems Design and ADDIE. The online drafting program is related to every topic presented in this chapter; therefore the background information is important for a sense of perspective. The online drafting program in this study is located at a two year college in the TCSG, which is a form of career and technical education.

The instructional systems design literature review provides a description of ADDIE, which includes how it has been used as a conceptual framework and a model to solve problems and create training. The next chapter presents the methodology of the study and provides a description of the phenomenological method of qualitative inquiry.

CHAPTER 3

METHODOLOGY

Introduction

Drafting technology has been offered as an online program of study in one college in the TCSG. It is one of the few industrial technology programs that can be offered in the online environment due to the fact that expensive industrial equipment is not a requirement. The problem this study aimed to address is the lack of distance education research in career and technical education. The research is needed for instructors to utilize as they attempt to address the pressure that colleges face to provide online education. There is a need to understand the process of utilizing online education in career and technical education. The phenomenological approach was used as the method of qualitative inquiry for guidance in this study.

The purpose of this qualitative study was to describe the experiences that related to the creation and maintenance of the online drafting program through the eyes of the drafting instructors involved. The study was guided by the following research questions:

1. How do the drafting instructors of the online drafting program describe their experiences when designing instruction for an online drafting program in a technical college setting?
2. How did the lived experiences of the drafting instructors relate to instructional design processes in the development of the online drafting program?

This chapter is divided into the following sections: (a) design of the study, (b) description of research site, (c) researcher's role, (d) participants, (e) interview data collection, (f) member checks data collection, (g) data analysis, (h) validity and reliability, and (i) researcher bias and assumptions.

Design of the Study

This study utilized qualitative methods to provide a phenomenological study of an online drafting program in Georgia. Individuals' interactions with their world are the foundation of qualitative inquiry and thus an understanding of these interactions and the meaning generated from them are the key to the study (Merriam & Simpson, 2000; Merriam, 2002). Meaning is not predicted in qualitative research as it is in positivist research. Guba and Lincoln (2005) wrote that an explosion of nonpositivist oriented research has occurred in the social sciences. This explosion comes from the need to explore and understand rather than to predict in certain situations such as the one in this study. This particular study has used a nonpositivist orientation in that there is an attempt to describe the lived experiences of the instructors through discovery and exploration instead of hypothesis testing. According to Patton (2002) "Qualitative inquiry is particularly oriented toward exploration, discovery, and inductive logic" (p. 55). Using inductive logic to learn how individuals experienced some phenomenon through their eyes is also looking at the study from an interpretive orientation (Merriam).

The most appropriate method to describe the lived experiences of the drafting instructors is through interviewing. This is true since the lived experiences of the instructors were events that occurred in the past. The researcher is unable to directly observe something that already happened, therefore interviewing is appropriate in this situation. Qualitative research relies on interpretation of such things as interviews and written information that describe a phenomenon (Auerbach & Silverstein, 2003). Qualitative research is quite different from quantitative research. "Qualitative researchers are not interested in people's surface opinions as in survey research, or in cause and effect as in experimental research; rather, they want to know how people do things,

and what meaning they give to their lives" (Merriam, 2002, p. 19). In the qualitative study, issues may be studied in detail to deepen understanding (Patton, 2002).

Different forms and types of qualitative inquiry exist in the social sciences. Merriam (2002) indicates that most qualitative studies can be categorized into the following types of qualitative research: (a) basic interpretive, (b) phenomenology, (c) grounded theory, (d) case study, (e) ethnography, (f) narrative analysis, (g) critical, and (h) post modern. While these different types of qualitative research share some basic commonalities, they also differ in procedure and purpose (Merriam). For example, the narrative analysis utilizes data in the form of a story from the perspective a person describing their life experiences whereas ethnography involves the researcher immersing in some culture for a period of time to better understand it (Merriam).

The true purpose of the study will determine the type of qualitative study the researcher chooses (Merriam, 2002). Sometimes more than one type could fit the study, so it is up to the researcher to best choose the type of study that will allow for the most information rich outcome. Since the purpose of this study was to describe the lived experiences of the instructors in the creation of the online drafting program, a phenomenological method of qualitative inquiry was chosen in an attempt to capture the meaning of these experiences through interviewing (Patton, 2002).

Phenomenology is generally believed to be both a philosophy and a method of qualitative inquiry. Phenomenology used as a method of qualitative inquiry "aims to identify and describe the subjective experiences of the respondents" (Schwandt, 2001, p. 192). Schwandt explained that phenomenologists must rely on careful description of the experiences such as perceptions

and feelings that one has lived. The actual data that will be collected and analyzed is the phenomena itself, through the words of the individuals involved (Merriam & Simpson, 2000).

Merriam (2002) explained that the essence of the phenomenon must be discovered through the individuals who experienced it. Additionally, Patton (2002) indicated that a phenomenon could be the focus of an emotion, a job, or even a program. The key to understanding the phenomenon is to describe how those involved directly experienced something first hand. Interviews were conducted to deepen the understanding of the experiences of these instructors.

The process of inquiry involves several steps that the researcher takes in order to gather all of the information needed to perform analysis and to produce the product of that inquiry. The following sections describe the process utilized in the design of this qualitative study. The following table is provided as an illustration to show how elements of the research design provide a roadmap of the study.

Table 1: *Design of the Study*

Statement of the Problem	Elements of Conceptual Framework	Research Questions	Interview Questions from Appendix E
The problem this study aimed to address is the lack of distance education research in career and technical education. The research is needed for instructors to utilize as they attempt to address the pressure colleges face to provide online education.	Instructional Design Using ADDIE: Analyze Design Develop Implement Evaluate	1. How do the instructors describe their experiences when designing instruction for an online drafting program?	Questions 1-15 all aim to bring forth the experiences of the instructors when designing instruction for the online drafting program.
		2. How did the lived experiences of the instructors relate to instructional design processes in the development of the online drafting program?	Questions 1-7 specifically address experiences that relate to instructional design. These could include all components of ADDIE.

Description of Research Site

The research site will be called ABC Technical College, a pseudonym, to keep the identity of the college undisclosed. The college is a unit of the TCSG and offers certificates, diplomas, and two-year degrees. ABC Technical College has been accredited by the Southern Association of Colleges and Schools (SACS) and also has specialized accreditation through the American Dental Association. Founded in 1962 and resting on over 150 acres, this college is considered to be in an urban setting although farmland can be found in the surrounding areas within the county. This brief description actually holds true for many of the colleges in the TCSG. Georgia has farmland near urban settings throughout the state.

Purposeful sampling instead of random sampling is used when the researcher uses qualitative methods instead of quantitative methods (Fraenkel & Wallen, 2000; Patton, 2002; Merriam, 2002). According to Schwandt (2001) "In the logic of sampling based on a theoretical or purposive strategy, units are chosen not for their representiveness but for their relevance to the research question, analytical framework, and explanation or account being developed in the research" (p. 232). Since there is only one college that has an online drafting program in Georgia, that college has provided the sample used to study how the program is delivered. This method of sample selection is also known as criterion sampling. According to Merriam "To begin purposive sampling, you must first determine what criteria are essential in choosing who is to be interviewed or what sites are to be observed" (p. 12). In this case, the criteria are: (a) must be an on-line drafting program and (b) must be a technical college in Georgia.

Researcher's Role

A common characteristic in all qualitative research is the primary instrument for data collection, which is in fact the researcher (Fraenkel & Wallen, 2000; Merriam & Simpson, 2000;

Merriam, 2002; Patton, 2002). Merriam wrote that the human instrument has many advantages in collecting and analyzing data, such as the ability to become both responsive and adaptive. Merriam indicates that further advantages include the ability to read nonverbal communication, do member checks, and explore surprising responses. Notes taken by pencil and paper are often used in addition to the possible use of audio or video taping devices when collecting data Fraenkel & Wallen). This study has used interviews to allow for the participants to share their experiences and discuss the meaning of those experiences. Thus, the researcher has been able to utilize the advantages of being the primary instrument for data collection such as reading the body language of the participants and asking the participants to verify transcripts for accuracy.

The human instrument does have disadvantages however, such as biases and subjectivities that if left unchecked can have an impact on the study (Merriam & Simpson, 2000; Merriam, 2002). These biases or subjectivities must be identified and monitored to illustrate how the human instrument may form the data that have been collected and analyzed (Merriam & Simpson; Merriam). This researcher does have experience related to the topic of study, therefore a researcher bias and assumptions section has been included in this chapter to aid in the understanding of the data collection and analysis. Patton (2002) wrote that the researcher should aim to take the stance of empathic neutrality, which is a middle ground between becoming so close that one's judgment is impaired and being so distant that a deep understanding is unlikely. Patton indicates that a qualitative researcher should be neutral in order to understand the meaning of the phenomenon under study and not go into the study with the goal of proving a particular perspective.

The role of researcher includes going out into the real world and doing field work, which according to Patton (2002) is actually "having direct and personal contact with people under

study in their own environments" (p.48). This allows the researcher to establish a connection and a sense of trust in order to collect the data, which in this case are the lived experiences of the drafting instructors. Immersion into the environment of those studied can lead to a deeper understanding of the topic, which is the true hope of all qualitative studies. Before the researcher goes out to the research location, cooperation from those to be studied is very important (Gay & Airasian, 2000).

Participants

The purposive selection of the participants under study is a common quality shared between qualitative studies. The participants are selected for their expertise and have the ability to share detailed information about the topic (Gay & Airasian, 2000; Merriam, 2002; Patton, 2002). The participants from this selected college in Georgia are the instructors of the online drafting program that had direct involvement in creation and maintenance of the program or courses in the program. These individuals are the key to the entire study as their lived experiences and the meaning associated with those experiences have allowed the researcher to study the online drafting program.

Quite common in qualitative studies, the design of the study may change slightly as new information is discovered and previously unidentified individuals may surface as important to the study. The qualitative study allows the researcher the flexibility to pursue emergent paths of discovery (Fraenkel & Wallen, 2000; Gay & Airasian, 2000). This could mean that some other person identified by the instructors played a significant role in the creation or maintenance of the online drafting program. It would be far too rigid to ignore this information and pass up the opportunity to interview a person that could lead to a deeper understanding of the online drafting program. This was actually what happened in this study. The first two instructors identified a

third person that played a very critical role in the creation of the online program of study. These participants will be discussed in next chapter where the findings are presented. Once the sample selection has been made, the next part of the process is to identify how data will be collected.

Interview Data Collection Procedures

A common form of data collection in qualitative research is through interviews. In fact, many quantitative researchers use forms of interviews as well. The use of interviews has become so common that many researchers have called the United States an "interview society" (Fontana & Frey, 2005). The purpose of these interviews may differ as such examples of interviews in everyday lives of Americans include college applications, political polls, and even appointments with physicians that include interviews (Fontana & Frey). Perhaps the key difference in the purpose of qualitative interviewing is the focus on a deep, information rich understanding of the topic (Gay & Airasian, 2000).

Merriam (2002) wrote that "the phenomenonological interview is the primary method of data collection wherein one attempts to uncover the essence, the invariant structure, of the meaning of the experience" (p. 93). Interviews in research are used to understand or discover what cannot be directly observed (Patton, 2002). In other words, it is not possible to observe the thought processes or feelings of these participants as they experienced them or any actions that happened at an earlier point in time (Patton). The primary data collection method in this study involved interviews with the participants in the study. The instructors mentioned in the participants section were interviewed in-person in order to have them discuss their experiences and the meaning of those experiences with the phenomenon of interest. However, email and phone communication was used to supplement the in-person interviews as needed.

There may not be a paper trail or audit trail for the researcher to learn how a process was started or developed, which means that simply asking the participant to share the details of the process would be the best way to gain the information. According to Patton (2002):

> Program evaluation interviews, for example, aim to capture the perspectives of program participants, staff, and others associated with the program. What does the program look and feel like to the people involved? What are their experiences in the program? What thoughts do people knowledgeable about the program have concerning program operations, processes, and outcomes? (p. 341)

Three different forms of interviews exist, which include informal conversational, general interview guide, and open-ended. (Patton; Merriam, 2002). It is up to the researcher to choose the most appropriate type of interview for the type of study. There is less skill required for a structured interview as questions are mostly in place and the freedom for in depth exploration may not exist to the extent that it does in a less structured interview where the skill of the interviewer can inject probing questions that lead to new important information rich topics (Gay & Airasian, 2000). Fraenkel and Wallen (2000) indicate that the less structured informal interviews are the most common in qualitative inquiry as they more closely bear a resemblance to casual conversations.

The informal conversational interview allows for a very flexible stance on the part of the interviewer as the direction of the interview has the freedom to change in an exploratory or probing nature depending on the emergence of topics that the researcher believe to be important to the study (Patton, 2002). This type of interview is common in ethnographic studies as many situations occur where the individuals under study do not even know that data is being collected (Patton). The difference in the interview guide style of interviewing is that there is a

predetermined subject or set of basic questions that focus around a particular subject that aim to guide the interview. There still lies a sense of freedom to explore and probe, however the guide requires the interviewer to be efficient with the time by staying within a certain subject (Patton). The interview guide can have a range of being more or less structured. The open-ended interview style tends to be more structured however. This style gives consistency to interviews of many individuals and the probes are placed in the interview at predetermined locations (Patton). This structured style attempts to leave nothing up to chance as all participants are asked the exact same questions that have been predetermined by the researcher (Fontana & Frey, 2005).

In this study an interview guide for the instructors was utilized as certain questions were included in order to elicit responses that provided useful data for analysis in the study (Appendix E). It was the aim of the researcher to keep the interview on the subject of the experiences in the creation and maintenance of the online drafting program; thus the interview guide kept the structure of the interview organized and on topic. However, this guide served as the base of questions that were discussed and other questions came out of the conversations as is typical for qualitative research when emergent topics related to the phenomenon surface(Gay & Airasian, 2000; Fraenkel & Wallen, 2000; Patton, 2002). The researcher utilized an audio recording device to further help to ensure accuracy of discussions from the interviews. Additionally, there was a pilot interview with a coworker that has considerable experience teaching online courses in the college setting in order for adjustments to be made to the draft interview guide. This pilot interview took place during the fall semester of 2009 and allowed for the researcher to find that the order of the questions needed a slight adjustment.

Gaining the trust of the people being interviewed and creating a good rapport with those individuals is essential to being able to obtain and understand qualitative data (Fontana & Frey,

2005). Fontana and Frey also warn of the dangers of becoming too close, "… the researcher may become a spokesperson for the group being studied, losing his or her distance and objectivity, or may 'go native' and become a member of the group and forgo his or her academic role" (p. 708). The researcher in this case had a professional relationship with the instructors under study from various state meetings; the creation of a good rapport was already present.

Member Checks Data Collection Procedures

The member checks of the transcripts increase the validity and reliability of the study as well as lead to the opportunity to clarify any discrepancies in what was said by the participants. Member checks refer to getting actual feedback from those that have been interviewed or observed to check that the researcher has accurately described the situation. It was the intention of the researcher to send an electronic copy of the transcripts to the participants for accuracy checks from the beginning. This did take place and a few discrepancies were identified by one participant and corrected. While it is true that the interviews are the primary source of data collection in this phenomenological study as Merriam (2002) suggests, the transcripts further strengthen the study as part of triangulation. Patton (2002) and Gay and Airasian (2000) among others have indicated that triangulation utilizes a combination of methods or data in order to strengthen the study.

Data Analysis Procedures

Analyzing data in a qualitative study consists of putting together a synthesis of all collected data from interviews, documents, or any other method of data collection and transforming that synthesis into a description of what was found in the study (Fraenkel & Wallen, 2000). This process is very descriptive in nature as no hypotheses are normally tested in a qualitative study. However, the task of putting together a data analysis can be overwhelming to

even the most experienced and organized researcher who can become buried under mountains of transcripts, audio tapes, and other documents (Fontana & Frey, 2005). It should be noted that the task of data analysis is not a totally separate procedure from data collection as it is in quantitative studies.

Data analysis is actually going on during the data collection as the two processes are intertwined (Fraenkel & Wallen; Merriam & Simpson, 2000; Patton, 2002). Merriam and Simpson indicate that this simultaneous action of both collecting and analyzing data create a needed advantage that will allow the researcher to make adjustments such as following a new direction that may emerge as having importance to the study. If a researcher waits too long to begin organization of the data, then there is a risk of losing key information to the study. Denzin and Lincoln (2005) add that data management methods such as computer assistance may greatly help the researcher as well.

According to Ruona (2005) "qualitative data analysis is a process that entails (1) sensing themes, (2) constant comparison, (3) recursiveness, (4) inductive and deductive thinking, and (5) interpretation to generate meaning" (p. 236). Sensing themes is a method of organizing the data to help the researcher make sense of all of the information. Strategies to aid the researcher in data analysis exist, such as the constant comparative method. The constant comparative method of data analysis in qualitative research is perhaps the most common strategy used by researchers (Merriam & Simpson, 2000). This method allows for data to be analyzed early and often. According to Schwandt (2001):

> In this method for analyzing qualitative data, devised by Barney Glaser and Anselm Straus, data in the form of fieldnotes, observations, interviews, and the like are coded inductively, and then each segment of the data is taken in turn and (a) compared to one or more

> categories to determine its relevance and (b) compared with other segments of data similarly categorized. As segments are compared, new analytic categories and new relationships between categories may be discovered. (p. 30)

The use of the constant comparative method or variations of this method normally utilize the same basic steps, however some researchers use this method as a part of the grounded theory paradigm and strive to generate a theory from the study (Patton, 2002). The purpose of this study is not to theorize, but to describe the experiences related to the instructional design process in the creation and maintenance of the online drafting program through the eyes of the drafting instructors involved. Therefore the constant comparative method was used to help the researcher analyze by inductively coding data from the interviews, member checks, and documents while comparing the categories of these data (Schwandt, 2001).

Patton (2002) wrote that when a predetermined theoretical framework is being used, the analysis is actually first deductive before becoming inductive. In this case the researcher believed that most of the experiences of the instructors would be able to be coded into one of the phases of the ADDIE model. This framework functioned in the background of the study and proved to be useful in data organization.

Recursiveness in qualitative research refers to the awareness and act of constantly going back over notes and always analyzing the collected data. "This will help you understand what is emerging in the data, reconstruct the data as needed, and inform your study as it progresses" (Ruona, 2005, p. 237). Inductive and deductive reasoning are the means to which researchers actually sense themes, constantly compare, and act with recursiveness when doing qualitative research (Ruona). Interpretation to generate meaning is where the researcher really starts to connect the dots. Basically the researcher must think deeply about the data and look past the

information to really understand what has been collected and observed (Ruona). Sensing themes is a method of organizing the data to help the researcher make sense of all of the information.

In this study, the data analyzed consists of the interviews (recorded and transcribed) and member checks. It was not necessary to go back and do follow up questions after the interviews had occurred to clarify a topic or an answer to a question in this particular study as the initial interviews provided data necessary to create the thick and rich descriptions that are typical for qualitative studies.

Validity and Reliability

Credibility and trustworthiness are very important in the world of research. According to Ruona (2005), three main issues concerning the trustworthiness of the research are the internal validity, consistency of the findings, and external validity. "Internal validity addresses the extent to which the findings make sense and are credible to the people we study as well as to our readers" (Ruona, p. 247). Literature is available for researchers on the topic of increasing validity and reliability and nearly all mention the use of triangulation as being an excellent method of increasing validity and reliability (Fraenkel & Wallen, 2000; Gay & Airasian, 2000; Merriam, 2002; Patton, 2002). According to Merriam "… what someone tells you in an interview can be checked against what you observe in a field visit or what you read or see in documents or artifacts relevant to the investigation" (p. 25). Triangulation in the form of using interview data and member checks took place in this study to increase the validity and reliability of the findings.

External validity is confusing for some to understand in terms of qualitative research. "Part of the problem lies with the common perception of generalizability derived from a positivist-oriented research wherein one can generalize in a statistical sense form a random sample to a population" (Merriam, p. 28). Patton, Merriam and others indicate that a transfer of

knowledge from an in depth study to another similar situation can occur without the use of statistics.

Researcher Bias and Assumptions

As a drafting program director at a technical college in Georgia, this researcher has experience teaching web-enhanced and hybrid courses. This researcher also has difficult time believing that many industrial technology programs can be effectively taught in an online environment due to equipment constraints and hands on experience constraints associated with industrial programs. However, drafting is one of the few exceptions. Most industrial technology programs like machine tool, automotive, and electronics require expensive equipment and in most cases the labs cannot be duplicated from the average household. In contrast, drafting majors can simply download the latest CAD software and do all lab work on the personal computer from the comfort of home or wherever they have a computer (Autodesk, n.d.; SolidWorks, n.d.).

This researcher is a firm believer in making constant improvements to courses and programs. It was an enjoyable process to study an online drafting program through the lens of instructional design using the ADDIE model. Being quite computer literate and familiar with technology, this researcher expected to understand any technological aspects of materials or methods in the field of study and therefore there were no surprises about new technology or unfamiliar technology.

In an unfortunate way, some students will seek to enroll in an online program instead of one that meets on campus because they might assume that it will be less challenging. However, one actually must put forth more diligence and self motivation in an online program as there is more freedom to either perform or not. There is no person standing over students to ensure that homework is complete. This study could provide a transfer of knowledge to help make decisions

about programs that seek to move to the online delivery format or that are currently taught in the online delivery format. It is the hope of this researcher that this study will do just that, thus providing insight into this particular phenomenon.

CHAPTER 4

FINDINGS

Introduction

This chapter presents the findings of the study that are relevant to the guiding research questions. These findings are brought forth in the discussion through the use of categorized themes identified by the researcher. A description of the categories and themes and how they are utilized to present the findings is provided in the beginning of the chapter to address the first research question. The second research question is then addressed through a discussion on how the experiences of the instructors were related to instructional design. The purpose of this qualitative study was to describe the experiences related to the creation and maintenance of the online drafting program through the eyes of the drafting instructors involved. The study was guided by the following research questions:

1. How do the drafting instructors of the online drafting program describe their experiences when designing instruction for an online drafting program in a technical college setting?
2. How did the lived experiences of the drafting instructors relate to instructional design processes in the development of the online drafting program?

The Participants

Purposeful sampling instead of random sampling is used when the researcher uses qualitative methods instead of quantitative methods (Fraenkel & Wallen, 2000; Patton, 2002; Merriam, 2002). This study focused on the only college in the state of Georgia that has an online program of study in drafting. The drafting instructors directly involved with the creation and/or maintenance of the online drafting program at this college served as the participants in this study. The participants preferred to keep their names private; therefore pseudonyms were used, which is

quite common in qualitative studies. The pseudonym names used here are Thierry, Fletcher and Greg. Interviews were conducted face to face between October 2009 and December 2009. All interviews took place at ABC Technical College, where the online drafting program is based. ABC Technical College is also a fictitious name used to keep the name of the actual college private. Table 2 is provided below for an overview of the participant information. This information consists of the participant pseudonym, number of years in education, number of years in the drafting industry, and the participant age.

Table 2: *Participant Information*

Participant Pseudonym	Number of Years in Education	Number of Years in Drafting Industry	Age of Participant
Thierry	17	25	63
Fletcher	12	13	46
Greg	18	10	48

Individual Participants

Thierry. Thierry is currently a drafting instructor at ABC Technical College. He indicated that he wanted to participate in the study since he has been a part of the program for over 15 years and felt a sense of responsibility to share the experience. The interview was conducted face to face in his office at the college where Thierry is a faculty member. His answers to the questions were brief and concise compared to the other participants' answers, but the information he shared was very useful to the study.

Thierry worked in the drafting industry for many years prior to working as a faculty member and indicated that he enjoys sharing his knowledge with others. He started as an adjunct instructor while still working in the drafting industry back in the 1990s. As the drafting program grew in size, he eventually joined the faculty as a full time member. He teaches online courses and traditional on campus courses in the drafting program.

Fletcher. Fletcher is also a drafting instructor at ABC Technical College. He was very quick to volunteer to participate in the study and was excited to share as much information as possible. Fletcher's interview was also conducted face to face in his office at the college. Fletcher is the program director and teaches online courses in addition to traditional on campus courses in the drafting program.

Fletcher, like Thierry, also worked in the drafting industry for many years before joining the college as an instructor and also got his start as an adjunct instructor. He indicated that the experience he had gained before becoming an educator has helped to shape his mentality to be effective and efficient in his work at the college. He explained how the industrial work environment and the college environment are alike in that, “You have a vision, and once you get that vision into production you can always make simple changes to improve quality" (282-284).

Greg. Greg is currently the president of a technical college in the Technical College System of Georgia. He was the drafting program director before Fletcher at ABC Technical College and agreed to meet there for the interview, which took place in one of the CAD labs in the drafting department. Since Greg was the pioneer behind the online drafting program in the beginning, he was very excited to share his experience and to be a part of the study.

Like Thierry and Fletcher, Greg also worked in the drafting industry before becoming an educator. After Greg moved from the classroom to the administration building, he still played a role with the drafting program since he had put so much work into converting courses from traditional on campus courses to courses which were deliverable online. When asked about the experience and about being an online drafting course pioneer he said, "it was kind of exciting, you know learning something new and being the first one out there" (54-55). Greg gave the impression that he is a leader that gets results through his ambitious nature.

Overview of Findings

The interviews were very successful due to the participants providing thick, rich descriptions of the experiences related to the online drafting program. In order to analyze the data, the constant comparative method of analysis was utilized in this qualitative study. The qualitative researcher must look for patterns in the data and then give those units of data names or codes (Merriam, 2002). Categories and themes emerged from the data analysis as the researcher analyzed the interview transcripts and found units of data that appeared to be relative to the guiding research questions of the study. These units of data were coded (Appendix D) in order to aid in the analysis process. A frequency count (Table 3) was then completed based on the coding scheme.

Table 3: *Frequency Count for Categories and Themes of Study*

Categories	Frequency	Themes	Frequency
Rapid Change	23	Technology	12
		Tools of the Trade	11
Support	23	Administration	13
		Technology Support	10
Freedom	18	Procedures	11
		Student Time	7

The emergent categories from the analysis were rapid change, support, and freedom. Table 3, the Frequency Count for Categories and Themes of the Study, illustrates how many times each category and each theme was found in the interview transcripts. The researcher arrived at these categories by repeatedly going back over the transcripts in order to sense themes and reorganize the data. The themes identified were then put into categories and analyzed for meaning. The act of using this system of organizing the data from the identified patterns in the interview transcripts is how the researcher is able to answer the research questions. There will be

a brief explanation of each of these themes and categories next before the examples of the experiences are discussed as they relate to the research questions.

The first category, rapid change, was used to categorize the themes of technology and tools of the trade. The word rapid means fast or quick by definition. Rapid change or evolution, as the participants repeatedly mentioned, allowed the online drafting program to become what it is today. For example, technology such as communication technology and computing technology kept changing so much each year that it allowed the instructors to create and maintain coursework more efficiently. Technology rapidly changing became a theme as it was found in the transcripts repeatedly. It was also thought to be relative to the research questions since it helped to shape the experiences of the drafting instructors.

Tools of the trade includes drafting equipment that drafters use to create drawings also fits into the category of rapid change. Examples of such tools that were used in the drafting field were known as manual tools before computer aided drafting (CAD) became more popular. The most common manual tools for drafting are the t-square, compass, protractor, eraser, mechanical pencil, shape templates, and triangles. CAD revolutionized the drafting field by making the work of drafters more efficient as computer software was utilized to create drawings. After drafting tools changed to become CAD based tools, they continued to change and impact how the instructors created coursework. The rapid change in the tools of the trade became a theme since it also was identified as a repeating pattern across the transcribed interviews that helped to impact the experiences of the drafting instructors.

Support was used to categorize the themes of administration and technology support. The word support used here can be thought of as giving aid or help. It is through administrative support that the instructors were allowed to obtain equipment and training for their program. The

instructors all discussed how vital the administrative support had been in the successful implementation of the online drafting program. This theme of support from the administration was found numerous times in the transcribed interviews and also helps to further the understanding of the experiences described in this study.

Technology support became a theme in this study as it was identified in many places in the transcripts and also helped to describe the experiences of the instructors. This kind of support came in the form of anyone that provided help in solving problems that dealt with technology, which at times included the instructors acting as technology support for each other and for students. Technology support was not limited to staff that do only technology support as their primary job duty.

Freedom categorized the last two themes, which are procedures and student time. Freedom, meaning non-restrictive or independent, is what these themes have in common. The theme of procedures recurred throughout the transcribed interviews and fits into the category of freedom since it was made clear that nothing procedurally stood in the way of the instructors as they worked on instructional materials in the online program. In other words, the faculty members did not have restrictive procedures that they had to follow while creating and maintaining materials. There was a sense of freedom to do whatever needed to be done and this allowed for creativity.

The theme of student time also was best categorized as a form of freedom. This referred to the fact that students had freedom to work on their coursework whenever they wanted to. Students in an online program do not have to be in class at a certain time or place. They do not have to worry about time conflicts with other parts of their life such as work or family. This theme was found to be important to the study as it helped to describe why the instructors had to

create and utilize methods to demonstrate the use of CAD software in an anytime anyplace format.

To specifically address the first research question, the themes are further discussed and specific quotes from the transcribed interviews are provided as examples to support the researcher's interpretation of the shared experiences.

Question 1 stated:

1. How do the drafting instructors of the online drafting program describe their experiences when designing instruction for an online drafting program in a technical college setting?

Rapid Change

It became obvious as soon as the interviews had been conducted that rapid change of technology and rapid change of the tools of the trade would be important themes in this study. These themes aid the researcher in describing the experiences of the drafting instructors as they designed instruction for the online program. The participants discussed how this rapid change played a significant role in the online drafting program's development. The rapid changes refer to broad spectrums of technology such as computer hardware, computer software, internet technology, communication technology, and even how drafting tools have changed through the creation of computer aided drafting.

Greg, the former drafting program director, provided an example of how much technology had changed and evolved in terms of how students would communicate with him when he first put coursework on the internet. Greg stated:

> Even back then instead of doing a lot of emailing when the student needed help we used beepers. So I gave out my beeper number to a student and it would vibrate and go off

> when they had a question and it would show me their phone number and I would call them and answer their question. (16-19)

Greg actually started laughing when he explained this in the interview as he explained that he knew how ridiculous the idea of using a beeper might sound in today's high tech world. Smart phones are much more common now and one would be really challenged to find a person that still uses a beeper. It does, however, provide a sense of where Greg started and what kind of barriers he faced as he tried to get the drafting program online.

Fletcher shared some interesting information on how the rapid change of technology has influenced how he helps students online and how he is able to generate materials for demonstration. He explained:

> You know, the technology has evolved…, using screen capture programs like SNAGIT to do little lectures yourself when somebody is having trouble trying to understand something. You go to your computer and use the SNAGIT tool to do a screen capture and send them that specific file that addresses the problem or whatever. Or call them on the phone, there are several different, new technologies to hook up to. You can take control of their computer and walk them through it. (179-185)

Fletcher articulated the fact that it is much easier to show a student how to do certain things in CAD programs than it is to tell them or to have them read about it. This is why he spoke of taking control of a student's computer remotely. There is technology now that will allow an outside user such as the instructor to actually take control over the mouse at the student station and demonstrate.

The SNAGIT software program Fletcher discussed is a popular screen capture program that allows the user to take pictures of whatever is on the computer screen to aid in

demonstrating procedures using computer software. Camtasia Studio comes bundled as part of the SNAGIT software package and allows the user to record a video of actions on the computer screen. The user can also speak into a microphone to add audio explanation of what is being demonstrated. He indicated that he is able to record a demonstration of the CAD function that is giving the student a hard time.

This is quite different from when manual drafting tools were the industry standard. Greg was at the college when manual drafting tools were still being used as he first took over the program. When discussing the process of moving courses online, Greg stated that "as I was rebuilding everything and converting to CAD, this was just one more step in the process as I saw it" (84-86). He explained that it was just after the school had started moving into more CAD based drafting that he started looking into moving coursework online. He felt like the move from using manual drafting tools to using CAD for creating drawings was the most vital change that allowed the program to go online.

Technology

The rapid change of technology became the first theme that was identified in this study since it played such a large role in how the online drafting program came to be. The participants discussed how much technology had changed in many ways and how that change impacted their work as instructors. Greg indicated that the entire interface with computer technology has changed and evolved in a way that makes everything much easier now. Greg offered the following example of this point from when he first started trying to move courses to the online environment:

> We didn't have point and click. Everything was still pretty much DOS based, even with Windows you had to learn a lot of commands, all those html commands. Even with

> FrontPage, which was their first web page software, you could go into the source code and make changes. (50-53)

Greg's example of the computer software interface provides a good point of reference since the use of DOS based commands has been long gone for most computer users. Computers utilizing a point and click interface is quite common now.

Computers were very expensive for several years during the time when Fletcher became a full time faculty member. For example, Fletcher explained that when he first started teaching, computers were still not affordable for all of his students. He stated:

> The computers were still relatively expensive so as far as an online program outside the class was really not feasible at that time. I think in 1998 I bought a computer and it was roughly three grand. So you know that was not your typical pc [in that it needed to be powerful enough to run CAD software]. (13-16)

Fletcher explained that while they did have many courses set up for online at that point, there was not nearly as many students with the technological capability to take online courses as there are now. As the years have passed though, more changes in computer technology have occurred which has allowed the price of computers to fall dramatically. This gives students the opportunity to purchase a very powerful computer for a fraction of the price Fletcher spent in 1998.

Fletcher also discussed how once computers became more mainstream and affordable, there were still other issues that the rapid change of technology helped him to overcome. Fletcher mentioned that file size and file type were issues which caused problems. He provided an example of this through explaining his thought process when trying to design his coursework with those two particular issues in mind.

> [When making decisions on file types] what you do is you want to look at I guess what the easiest way for students to view this you know [the instructional materials]. Is it Word? Is it PowerPoint? Is it html? Is it a .pdf file? What size does it take? Which takes less size as far as uploading to your system? PowerPoints take up a good bit. You can convert a PowerPoint to a .pdf file [now] and save it and it's half or a third of its size if you loaded it as a true PowerPoint presentation. (169-174)

Fletcher explained that he converted his PowerPoint files to .pdf file extensions, which are Adobe Acrobat files. The .pdf stands for portable document format and if one has the latest version of Microsoft Office then they are able to save files in this format from Word, PowerPoint, or Excel. This makes for much smaller and more easily accessed files for students since Adobe Reader is provided for free online. Fletcher discussed the fact that not every student has Microsoft Office since it is not free, but Adobe Reader is free.

Fletcher provided some very rich information on this theme of rapidly changing technology. He further discussed problems students have with bandwidth taking online courses.

> So if you have somebody that has low bandwidth, back when we first started most students had dial up. So you know if you are trying to watch a PowerPoint it isn't going to happen. So then you have to download it, well that download may take an hour for, you know, a 12-15 meg[abyte] file. Whereas today everybody has a dsl, satellite, or cable modem. Now a 12 meg[abyte] file takes a minute or two to download. (174-179)

He explained how the internet service providers have also lowered the cost as the demand for internet access and competition to provide it has grown. This has allowed most students to have faster internet service for a fraction of the cost of when larger bandwidth services first became available. The instructors also brought up the fact that even though prices have fallen as the

technology has changed, some students still live in rural areas where a digital subscriber line (DSL) is not available and therefore may be limited to dial up internet connections.

These types of issues impact how the instructors design their instructional materials on a day to day basis. They have to always keep in mind how their instructional materials will be accessed by the users, which are students. Using file types that can be accessed with free software has helped them tremendously. Additionally, the effort to keep bandwidth requirements in mind as they utilize video tutorials to demonstrate CAD tools and functions has proven to be quite essential in their quest to provide distance education to those that want it.

Tools of the Trade

The second emergent theme under the category of rapid change was tools of the trade. This refers to the change in how common manual drafting tools consisted of a pencil, drafting board, compass, t-square, protractor, and triangles many years ago and now they have been replaced by computer aided drafting (CAD) software. The speed of a drawing created using manual tools is considered quite slow when compared to the same drawing created using CAD. To take this theme a step further, even within CAD there is a constant evolutionary change in how the programs work. For example, three dimensional programs have spawned from two dimensional CAD systems. These new systems change every year to add new and improved functionality aimed to make the work of the drafter more efficient.

Greg began working for the college in 1992 and started teaching before CAD became the standard for the drafting field. His firsthand experience with the change to CAD helped to take the drafting program from a manual tools based education to a program of study that used digital technology. He explained:

> Of course when I got here as the drafting instructor it was primarily board drafting and a lot of companies had already started progressing into a CAD environment. AutoCAD was in its early stages, I think it was version eight or so back then. So we started converting the lab over to more CAD and less manual or board drafting. (2-5)

Thierry indicated that he had a plethora of experience using the older tools of the trade before coming to the college. He also wanted to explore and learn more about the new emerging technology called CAD. When Thierry started working at the college he said, "first we really came to the conclusion that technology was changing so much that this board work had to go and everything needs to be on the computer" (66-68). He went on to say, "So we started getting rid of all the board equipment" (68-69).

This change to CAD from manual drafting tools allowed for the program to go into the digital world. In other words, the tools were now computer based which would be far more compatible with online studies. Drawings could be emailed instead of mailed through the postal service for example. The real difference for the instructors was how they were maintaining and creating the instructional methods and materials for the drafting program as the tools of their trade were changing at a rapid rate.

When the program was primarily manual drafting based, the instructor never had to worry about what new changes in drafting tools would impact the educational curriculum. The compass and protractor are used the same way today as they were used for the past several decades. However, the change to CAD required all new skill sets and new materials for instruction. In some ways teaching CAD required less work than teaching manual drafting. For example, to teach a student the proper technique using manual tools to draw a basic shape like a circle requires demonstrating how to hold the compass properly while not making the mistake of

making the circle's line weight too thin or too thick as it is drawn. In CAD, on the other hand, the instructor chooses the circle function and demonstrates how the use the software to draw the circle at the desired line weight.

Once the instructors made the transition into CAD, they discovered that the CAD software companies had to release updated versions over time in order to keep making improvements. The instructors indicated that as new versions of the software programs were released each year, there was immediate pressure to get updated to be able to provide students with the most up to date technology in CAD. This equates to instructors spending time with each newly released software program being used in the drafting program and learning the new tools and functions.

Sometimes the changes were very minimal and other times the changes were vast. One good example of a vast change is when the CAD programs changed from using drop down menus to using a ribbon system, which is the same kind of change Microsoft Office did in 2007. The users had to adapt in order to be proficient with the new system. The Autodesk Suite of CAD programs made this change within a year or two after Microsoft Office did their redesign of the user interface using the ribbon system.

Fletcher discussed the fact that these changes in drafting tools have brought about some amazing things in the field of drafting, such as new learning tools that aid in understanding how to use the latest CAD software.

> [Learning Websites] They have instructors go out and do one and two minute training tutorials and the drafting programs can subscribe to that service. So depending on what software you use, they have all the Autodesk products. They have some Pro-E and

> Microstation stuff too I believe... Some students don't get much out of a book and need the hands on or video help. (139-147)

Fletcher was really excited about this and indicated that the learning websites allow for him to have more flexibility with his planning time. He previously spent countless hours creating many instructional videos for using the various CAD programs. However, now he is able to allocate more time to find the perfect videos and laboratory assignments that support the learning competency required by the state standards.

Support

The category of support that emerged from the data analysis also contained two themes. The two themes were support in the form of administrative encouragement and financial backing by administrators and technology support from the information technology staff on the campus. In addition to the technology support staff on campus, those that could provide help with technical difficulties were discussed as being relevant to guiding research questions. This actually included the drafting instructors serving as technology support for other faculty members and students.

The instructors also were supported by students and local industry. All programs in the technical college system in the state of Georgia are required to maintain an advisory committee made up of members that work in the field of the program of study. In this case, the instructors were able to seek information such as trends in the field of drafting to inform their college curriculum. Students also were supportive in that they expressed a desire for online courses and also were able to provide feedback on the instructional materials that the instructors designed.

While many people were involved in the support role of the online drafting program, it was the support from the administration that seemed to be the driving force behind the program.

Greg discussed how vital he believed the administration's support was by indicating the following as he discussed what went right in the whole experience of creating an online program of study:

> Good support. The most critical thing was the administration's support. If that support was not there, then nothing would have happened. The excitement would have died after a while and we would have figured it was just extra work and let it go. (230-233)

Administration

The emergent theme of support from the administration was discussed by each participant in some way. When Thierry was asked about support in general, he said "As far as a support system, I think our director at the time was a big help" (69-70). He further declared when asked specifically about the director that he was "very supportive" (74), and went on to add that "We had one of the better programs on campus as far as he was concerned" (74-75). Thierry elaborated:

> Yeah, we had everything we needed as far as equipment and so on [financial backing from administration]. ..Anything we thought we needed, we could go ahead and submit a request for it and we knew that we would not have a problem getting what we needed. (81-84)

Fletcher also confirmed this when discussing the administration's involvement in supporting the online drafting program. He stated the following:

> Yeah, you know, as far as equipment they donated or gave us what we needed to start with. I think their commitment to online education is evident in that they were one of the first seven colleges to be the Georgia Virtual Institute, you know, before it was a college. So they would give you extra pay when you were developing courses, so that

> was kind of an incentive, a little monetary supplement. Especially if it is an adjunct instructor developing a course. They would pay them for a certain amount of hours to develop that course for online. (101-107)

This is how Fletcher got involved with the online development of instructional materials. He started as an adjunct instructor teaching courses part time at night before he started taking on additional adjunct contracts to develop online materials.

Greg, now an administrator himself, really emphasized how important support from the administration was. He said, "With that support, it allowed me to go get training or get a new version of FrontPage, or software or basic html classes, or advanced classes" (233-235). Greg further discussed the following:

> Administration was one hundred percent behind this. Our president wanted to be the first with anything. He wanted to have the most online students. He wanted to pull students from other colleges maybe. He saw it as a way of increasing enrollment, increasing revenue from tuition and building numbers. So I was encouraged the whole way. Anything financially that I needed was provided instantly. (113-117)

This type of support proved to have a huge impact on the program, which played a role in how the instructors were able to carry out day to day tasks when creating and maintaining the online program. For example, given proper training and money to purchase and use the software to design instructional materials, the instructors had barriers removed from their path. Basically the opportunity to excel was provided by the administration's support.

Technology Support

The participants all discussed how important technology support is when developing online coursework. This emergent theme under the category of support seemed to represent

something that would have been great to have, but that it was not always there. This is especially true for when the instructors first started creating materials for online coursework, which was before the colleges started using learning management systems (LMS). Examples of the LMS include Angel, Blackboard, and WebCT. These systems typically house documents such as syllabi, laboratory sheets, instructors notes, and tests. The LMS also has functions for tracking user data and communicating, which includes a mail system and discussion board.

Greg, the pioneer of the online drafting program, was busy creating online materials long before the LMS was used widely and sometimes needed help with technology related issues. He discussed this topic when asked about people that helped him with technology support. He stated:

> Only the VP of Instruction. He was a tech person. So we basically worked together like a two man crew. He would review some things and figure out a way when I would get bogged down with something. He might have a way to link things or help me with the server some, which he was more familiar with the college's servers not the ones in my lab. There was support from him but no one here really knew how to do anything on it. (120-125)

Thierry, one of the current drafting instructors, explained that "We mostly figured it out ourselves" (91). He indicated that in the beginning, there were not that may people that could really help out since it was a new thing. He added, "Later on we got IT folks on campus and when you have a problem you can consult them, but most of the time we just figured it out ourselves" (91-93).

Fletcher felt very strongly on this subject. A problem that became evident was the lack of technology support from the LMS providers. He seemed to point to the fact that support from

Angel, currently the official state LMS for the past several years, was not the best. He elaborated on this theme:

> Yeah, well basically, when its trial and error it's frustrating a lot of times when things don't work like you think they should. When you get something you think will work and you upload it and the system doesn't support it, or it hangs up or it's slow because bandwidth, DTAE not buying the proper support. You have to wait two days, three days to get an answer back from them on an issue. And you know, in today's market, everybody wants it now. You've got to be responsive in an online program. You can't tell a student I'll get back with you in three days when technical support gets back to me. You have to do work a rounds, you have to tell students to send email directly to your email account instead of going through the provider or something like that. (216-225)

Fletcher is a technological person and is able to get through many challenging situations on his own. However, he and Thierry support each other and utilize the expertise of the information technology staff as needed.

The instructors also acted as technology support for their students. The students frequently asked the instructors for technology support when needed. The most common issues students had were related to installing software and/or getting the software properly activated. Students with laptops that live near the campus have even gone to the extent of bringing the computer to the college to get the instructor to help them with issues such as these. Other issues that the instructors had to provide technology support involved helping students troubleshoot access to the online resources that require usernames and passwords. Such resources include the LMS and the community for students and educators provided by Autodesk.

Freedom

The category of freedom emerged from the data analysis and seemed to be a category of major importance to the participants. Freedom from procedures and freedom for student time were quickly identified as themes in this category. What could be viewed as a positive thing or a negative one is the freedom to have zero procedures to control the creation of the online drafting program. Experimentation with many different ideas is allowed to take place to discover what works and what does not. Greg captures the essence of the freedom that he felt when he stated, "since nobody else was doing this, it was how I thought I should do it" (90-91).

To put this into context, Greg was developing instructional materials for internet delivery several years before it was popular to do so. Greg was the only one creating materials for a hands on career technology program in the state. This further separates Greg's work from the other course developers that were starting to bring instruction to the internet. The other courses being developed were general core classes that were lecture based, such as English and Psychology. These lecture based courses are different from drafting courses in that drafting is an industrial program that requires demonstration of how to use tools of the drafting trade, such as CAD.

Most of the general education courses had a set format for the most part in that they would provide instructor notes and lectures in a document to be read by the student. Some versions of these courses would even record audio for lectures so that a student could actually hear the voice of the instructor. The typical assignment would then be a writing assignment. Greg on the other hand, had to be creative since he had to figure out a way to utilize other methods to demonstrate how to successfully create drawings using CAD. As Greg indicated, there really was no one else to get information from or from which to seek guidance. There was freedom to do whatever he wanted since the conversion process was so unrestrictive.

Procedures

Trial and error is something that the participants mentioned several times during the interviews. This was true for the theme of freedom from procedures. Without specific guidelines, other than curriculum in the form of state standards, the instructor has all of the freedom in the world. Greg reports that "as far as procedures or policies that I had to follow, there was freedom to do what we needed to do" (105-106). Since he was the first drafting instructor to get this project started, he especially indicated that nothing stood in his way procedurally.

Greg discussed the fact that online courses at most colleges now must be approved by a committee that checks to make sure certain procedures are in place for quality assurance. There was no such set of procedures or committee when he began converting instructional materials for online delivery. He also articulated the fact that the whole process is so much different now since the LMS is set up to make the work of the instructor far less laborious. Since Angel holds the current LMS state contract for the state of Georgia, instructors don't have much choice in the matter when it comes to how they load coursework in the online format.

Thierry elaborated on the freedom from procedures as well and mentioned that students helped them to find their way by providing important information. He stated:

> I think the general reaction and concern from the group was the time it would take to do this. Then how we would try it out and see how well it would do with students. We also were thinking about getting feedback from the students to make improvements as we progressed. This part has helped us quite a lot. Being able to get feedback from students online. (139-143)

Thierry believed that if there were overly restrictive rules in place, then there is a chance that they may not have had the opportunity to field test instructional materials on the students. This

would not have allowed some of the great feedback that the instructors were able to get from their users.

Fletcher seemed to thrive on the freedom and related it back to his time in industry. He does not like to waste time and pushes to test out new ways of doing things to improve his program. When asked about procedures he had to follow, Fletcher said "Well, I guess we set the procedures, so we were doing what we needed to do" (287-288). He went on to add, "So, it is president, vice president, employees, and chief bottle washer all at the same time" (288-289). This indicates that they did everything at every level. They made their own policies and procedures to follow and then executed the work that had to be done along the way to get a finished product.

Fletcher further explained how he liked to have freedom from set procedures when creating online instruction:

> Let's just do it and if it works it works and if it doesn't then we can tweak it as we go. You know, that's my opinion, let's get it going you know. I guess that stems back from you know working in industry, you come up with a product and you've got a six month nine month design time before implementation. So you are talking about a whole new engine, transmission, tool system consisting of hundreds of drawings that you've got to have done and completed ready to go to production in nine months so it's you don't have allot of time to sit there and mull it over and say if we tweak this it will do this and this and this. You have a vision, and once you get that vision into production you can always make simple changes to improve quality. (275-284)

This is a great example of how the drafting instructors like to push forward without fear of failure. They all seem to have this belief that their hard work would ultimately pay off. If

something does not work perfectly the first time, then they will still have a chance to make it right. The freedom that they described provides the opportunity to be flexible as they create and maintain their online program of study.

Student Time

Perhaps the theme of freedom in the form of student time is the most alluring aspect of taking an online class. The participants all mentioned that this surely was a major reason for having an online program of study. No time constraints for coming to class means no time conflict with things like work and family. Fletcher gave details on this topic:

> You've got people who are uh just want freedom to not have to come to class. You know, they want to be able to do it when they want to do it. If it's six in the morning or during the normal person time from eight in the morning till five in the afternoon. They would rather spend that time doing something else and stay up till three or four in the morning doing their work. (61-65)

Thierry's comments on this theme were comparable to Fletcher's. Thierry believed that everyone should have the chance to learn. He confirmed that they wanted to help a wider range of students. He stated:

> Ok, we talked about how being in school during normal times was not possible for everyone. There are time constraints and work and family. But, if we could place our information online, then those students who can't make it to campus can have the same opportunity as the ones that can. (54-57)

The freedom for students to use their own time as they saw fit is the overriding theme in these two examples. It actually goes beyond work and family conflicts in that the freedom even reaches those that just do not want to come to class. Fletcher's comments indicate that some

people just prefer to do their work in the middle of the night (or whenever they want) and would rather not have to be in class at a certain time.

The fact that students would be able to learn from a remote location meant that the instructors had to provide materials that could be accessed any time and any place. For example, demonstrations of how to execute certain functions and commands had to be available to view online. They wanted to make sure that there were instructional videos and learning opportunities so that the students could be successful in the online environment. If a student had issues with a certain topic, the instructors would either find a video to address the problem or create one depending on the situation.

When Greg was asked to describe how he came to the decision to start an online program of study, he also mentioned this theme of freedom of student time as part of his rationale. He explained:

> And really one of the big decisions also was that we were losing students in their last quarter or next to last quarter to jobs. People were hiring them because there was just not enough drafters in the area. A lot of companies were in need. I was looking at job placement, completion rate, the program's number of graduates, and offering it online because it didn't interfere with their job since they could work on it at night and the weekends and so forth gave us the means to get them through the program. Plus it gave them on the job experience and I would allow them to change out work related assignments for similar academic assignments and I would sit down and grade it. So it made it easier to get them through graduation since they had already gotten the job and met the objectives for the program. So I was trying to help them get that diploma or degree in an innovative way that would allow them to get it. (33-42)

To understand this rationale, one must know that programs are brought under scrutiny if graduation rates fall too low even if the enrollment is high. This decision helped to solve this issue of low completion, which helped the students to earn the credential that they deserved as well. The impression was also given that even now in the online drafting program, students that have night shift jobs have the freedom to go home and sleep afterwards instead of being forced to come to class in the morning when they are just getting off from work since they can do their coursework when it best fits their schedule.

Instructional Design

The quotes from the interview transcripts as discussed in the themes and categories so far in this chapter have been relevant to the guiding research questions. However, there has been more of a focus on the first question with little mention of instructional design. It is important to first gain insight into the experiences of the instructors before knowing what, if anything, in their experiences is relevant to instructional design. As previously discussed, the ADDIE model was used as a conceptual framework to help the researcher keep the focus of the study in the necessary parameters. The acronym ADDIE stands for the most common phases involved in instructional systems design, which are Analyze, Design, Develop, Implement, and Evaluate.

To specifically address the second research question, the phases of the ADDIE model are discussed in this section in terms of how they relate to the categories and themes that were used to describe the experiences of the instructors.

Question 2 stated:

2. How did the lived experiences of the drafting instructors relate to instructional design processes in the development of the online drafting program?

It was decided to let the experiences tell the story instead of specifically asking about each phase of the ADDIE model. This allowed the researcher to view the experiences through the lens of the ADDIE model without asking the participants to fit these experiences into any categories. They are content experts from the field of drafting and it is not known whether or not these instructors have any knowledge of the ADDIE model or any instructional design processes. The participants indicated that they did not have backgrounds in the field of education, which makes this study even more insightful. The following table provides an illustration indicating which categories and themes relate to the corresponding phases of the ADDIE model (Table 4).

Table 4: *ADDIE Model with Categories and Themes*

Category	Theme	Analyze	Design	Develop	Implement	Evaluate
Rapid Change	Technology Greg Fletcher Thierry	X (13-16)	X (169-174)	X (50-53) (179-183)	X (183-185)	X (16-19)
	Tools of the Trade Greg Fletcher Thierry	X (66-68)	X (139-147)	X (84-86) (35-37)	O	O
Support	Administration Greg Fletcher Thierry	X (230-233) (81-84)	O	X (233-235) (101-107) (69-70)	O	X (113-117)
	Tech. Support Greg Fletcher Thierry	O	O	X (120-125) (216-225)	X (195-198) (91-93)	O
Freedom	Procedures Greg Fletcher Thierry	O	X (105-109) (275-284)	O	X (90-91) (287-288) (141-142)	X (139-143)
	Student Time Greg Fletcher Thierry	X (33-42) (61-65) (54-57)	O	O	O	X (33-42)

The letter X is placed in the table where data from the transcribed interviews supports the relationship to the individual phases of ADDIE. The letter O is placed in the table to show that no data was found that supports a relationship for certain themes and phases of the model. Since the transcripts have numbers associated with each line of text, those numbers are utilized to show which parts of the interviews relate to the individual phases of the ADDIE model. The instructor's pseudonym name is given in the table to show an audit trail of which interview was linked to the numbered lines from the transcription.

Analyze

The analyze phase is the first phase of the ADDIE model. It is in this phase that the instructional designer will perform a needs assessment of a given problem. Visscher-Voerman and Gustafson (2004) point out that this first step in the ADDIE model can provide the user with the opportunity to look at the problem and take time to explore. While the needs assessment and the opportunity to explore are taking place, the needs such as learning objectives, materials, and methods are identified.

The problem in this case was identified by Greg (33-42) when he explained that he was losing students to the workforce before they actually completed his program. It was great for the student to get a job, but it was at the expense of the drafting program's completion rate. Based on the data collected, it is the interpretation of the researcher that the instructors had to think about what materials and methods would be used to carry out this online program. The categorized themes placed in Table 4 that were identified by the researcher to show a relationship to the analyze phase of the ADDIE model are marked with the letter X.

The category of rapid change contains the themes of technology and tools of the trade. The data shows that without the rapid change of technology and tools of the trade, the idea of a

fully online program in drafting would not be feasible. The data points to the fact that that many forms of technology such as internet service and computers had to be considered in the beginning before any materials and methods could be designed for learning or teaching. For example, Fletcher indicated in lines 13-16 of the transcribed interview that computers were still too expensive for most students to be able to choose the online program as their path. This is a unit of data that supports the researcher's conclusion that many aspects of the problem had to be considered before blindly offering online courses with a false hope that an online program would yield high enrollment.

Another unit of data that supports a relationship to the analyze phase is from Thierry's interview (66-68). He believed that the drafting boards were becoming a thing of the past and realized that the decision to move to CAD was ultimately the best thing for the drafting program. This is part of the needs assessment that is commonly found in the Analyze phase of the ADDIE model.

The category of support contains a theme that fits into the analyze phase of ADDIE as well. Administrative support had to be considered in the needs assessment in order for the materials and methods to become attainable. Gagne et al. (2005) reported that the designer must ask some questions of himself during this phase, such as "How much time do you have to develop this course?" (p.25). The instructors discussed that they knew the online program of study would take time and energy beyond the normal work load.

An example of a unit of data that supports this relationship to the analyze phase is from Greg's interview (230-233). Greg indicated that the support the administration provided went beyond providing funds. He explained that the administration encouraged and fostered the idea so that the project could have a real chance at success from the beginning. Greg captures this

when he said, "The excitement would have died after a while and we would have figured it was just extra work and let it go" (232-233).

The instructors also realized that they needed equipment and support from administration which proved to be critical for them. Thierry's interview (81-84) yielded data that supports this claim. Thierry articulated the idea that they could simply get any equipment they needed because the administration supported them. This relates to the analyze phase of the ADDIE model in that the instructors had to take into consideration what was needed and how those items might be obtained.

The data also shows the category of freedom and the theme of student time relate to the analyze phase. Time conflicts with school, such as work and family responsibilities, can be resolved through freedom in the form of time. Online courses give students the freedom to do their coursework any time and any place instead of being on campus at a certain time. This consequently affects the materials and methods that would be needed for the program.

For example, the instructional materials needed to be available anytime the students needed them since there was no specific instructional time to hear a lecture or watch a demonstration. This meant that materials like video demonstrations had to be accessible for the student whenever the desire to view them occurred. Thierry's interview (54-57) provided a unit of data that supports the relationship to the analyze phase of the ADDIE model. Thierry discussed the notion that they could address time and distance barriers by changing the way they delivered the instruction to the students.

Fletcher's comments on this topic (61-65) were similar to Thierry's with one key exception. The barrier of time and distance did not necessarily have anything to do with work or family time constraints for some students. It was just freedom to not be forced to come to

campus at a certain time. This gives the student the opportunity to learn whenever and wherever without restrictions.

Design

The design phase of the ADDIE model is where the instructor creates the lesson plan which can include topics to be covered in a particular lesson, course or program. Since the analyze phase directly feeds this phase, it is important to design based on findings of the needs analysis. Visscher-Voerman and Gustafson (2004) reported that activities in this phase include the creation of possible alternate solutions to the problem explored in the analyze phase while also providing an outline or proposal to get to the solution.

The data in this study reflected two of the categories and some of the themes in those categories are relative to this design phase of the ADDIE model. Like in the analyze phase, the category of rapid change and the themes of technology and tools of the trade played a part in this phase. The data points to this through the influence in the creation and design of courses in the program. Examples from the data include the planned use of video tutorials and the free downloadable CAD software for the student to use at home.

Fletcher's interview data (169-174) specifically addresses this relationship to the design phase. He explained how he designed instructional materials utilizing technological strategies to create or convert files in the most accessible way for students. It was through his innovative design that allowed for the creation of instructional materials to be used in the anytime and anyplace format that typifies the online educational delivery model.

Fletcher also had comments (139-147) that addressed the relationship of the tools of the trade with the design phase. The change from manual drafting tools to the use of CAD has allowed for instructional videos to be recorded on the computer and uploaded for students to

stream. Fletcher explained that CAD learning sites contain a plethora of video instruction that cover a broad range of functions across multiple CAD programs. The planned use of such tools shows a relationship to the experiences of the instructors to the design phase of the ADDIE model.

The category of freedom and theme of procedures related to the design phase as well. Units of data such as when Greg pointed out that "It was wide open and they were pushing the whole way" (107-108) and when he added, "Nobody telling you what to do" (108-109) capture how free it was. This freedom from having specific policies and procedures to follow allowed the instructors to be creative in the ways they designed instruction for online learning.

Fletcher believed that since students learn in so many different ways, the ideal design for his coursework should not be limited to just reading the material and trying to complete the hands on labs. Instead, more supplemental teaching methods to cover a wider variation of learning styles were included in the design. For example, demonstrations and video tutorials were planned for the courses in the program. However, Fletcher made it known that one should not over analyze the design and waste precious time. His comments from the interview (275-284) gave the impression that while design is important, time is also important and changes can be made to adjust the design as needed.

Develop

The develop phase of the ADDIE model incorporates the duty of generating the materials that will be utilized in the course or program. One must remember that the designer has to establish which existing materials will work and if new materials need to be developed to accompany the existing materials (Gagne et al., 2005). Materials may already be developed which could be recycled and will go well with the design of the course, such as PowerPoint

Presentations or lecture notes. This phase can present challenges as design flaws may become evident when trying to develop based on what was designed. This is similar to finding an error in a blueprint when building a structure.

The data in this study reveals that two of the categories and some of the themes in those categories are relative to this phase of the ADDIE model. Like in the analyze and the design phases, the category of rapid change and the themes of technology and tools of the trade influenced the develop phase. Fletcher mentioned this specifically when he stated the following about the evolution of technology:

> You know, the technology has evolved..., using screen capture programs like Snaggit to do little lectures yourself when somebody's having trouble trying to understand something… you go to your computer and use the Snaggit tool to do a screen capture and send them that specific file that addresses the problem... (179-183)

Fletcher indicated that certain areas in courses had what he referred to as "sticking points". The development of small audio or video files to supplement the reading material allows students to overcome the barriers in the course according to Fletcher.

Greg also had comments (50-53) which support how his experiences were relative to the develop phase of the ADDIE model. He explained that there were challenges to overcome in the early days of trying to convert instructional media to an electronic format since computers were DOS based instead of point and click. His description of a past experience provides an example of the process utilized to create instructional materials. This unit of data provided by Greg supports the claim that his experiences are directly related to the develop phase.

The experiences related to the tools of the trade and its rapid change played a rather large role in the development of the coursework in the online drafting program as well. The instructors

would have had a very difficult time teaching students manual drafting skills through an online course, where things like technique need to be observed. The video instruction would have perhaps been a recorded video of a person using manual tools. Thierry mentioned how much the tools of the trade had changed during his discussion when he described how he developed some of the examples when he first started teaching at the college. He stated, "We actually literally hand drew some figures on paper and put some appropriate dimensions [on the figures] and scanned them into the assignment flow chart" (35-37).

This is much different from the methods used now as the drafting field has moved to CAD systems. The instructors are able to easily create demonstrations of how the software is used without using older methods like a video camera or hand drawing figures on paper to scan. For example, software tools can be demonstrated by recording the actions digitally on the instructor's computer screen and adding audio to the demonstration using a microphone. The participants mentioned that the new tools, which are CAD software programs, are free for students to download since educational versions have been made available to students by CAD companies such as Autodesk. This means that students can access the CAD software that they need for free instead of purchasing traditional drafting tools such as mechanical pencils and protractors.

Greg discussed how converting instructional materials to CAD was the catalyst that allowed the online program to be technologically possible (84-86). His past experience converting materials is a great example of what happens in the develop phase of the ADDIE model. To use existing materials and possibly modify those materials for use is a common aspect of the develop phase as previously discussed.

The category of support, which included the themes of administrative support and technology support, also related to the develop phase of the ADDIE model. Greg repeatedly mentioned that developing the materials would not have been possible without the administration and their support. One specific unit of data from Greg's interview (233-235) explains how administrative support incorporated encouragement and funds to purchase equipment and attend training. While the instructors were the only ones directly developing the materials and methods, it is quite obvious that the support of the administration played a vital part. This type of involvement is a more indirect influence, but very crucial to this phase.

Fletcher's interview data (101-107) on this theme supports the relationship to the develop phase as well. He discussed how the administration offered adjunct contracts to the full time drafting faculty as well as adjunct instructors to develop materials for online instruction. Thierry also contributed to this theme as it related to the develop phase (69-70). He mentioned that the director at the college helped to push them to develop materials for CAD and the online delivery system. Thierry believed there was no going back once the director was included in the discussion of going in this forward direction. While this is still an indirect role in the development, it is important to describe the experiences of the instructors and any influential factors discovered during data collection.

The support, known as “tech support” to most people who deal with any form of technology, also relates to the develop phase of the ADDIE model. The instructors indicated that since their program was such a pioneer, few people could help out with technical questions when they would get stuck. Greg pointed out that he relied on one person in particular, which happened to be his Vice President of Instruction (120-125). Greg knew this administrator was a technology expert and was great about lending a helping hand. He discussed how they worked

together to develop materials when someone with more technological expertise was needed to overcome problems.

Fletcher had a change in tone when he discussed this subject (216-225). He went from being excited when he explained what he did to develop some video tutorials to being frustrated when the learning management system (LMS) would not cooperate with his files. He specifically indicated that the support staff who worked for the LMS would not help out in a timely manner. This created development issues for the instructors. This sometimes led to what Fletcher called "work a rounds" (223). This means possibly going back to the design phase momentarily, or just executing the design a little differently than originally planned. The end of this phase means the course is ready for students.

Implement

The implement phase of the ADDIE model is the chance for the instructors to test the hard work they have put into the previous phases. "In curriculum literature, the term *implementation* refers to the actual use of a program by its intended users" (Visscher-Voerman & Gustafson, 2004, p.74). Therefore the product is either completed or mostly completed and ready to be what is called pilot tested or field tested (Gagne et al., 2005). If the course is considered totally finished and will not be modified during the term while it is live, then this is called "launching" the course instead of field testing (Gagne et al.).

The data points to all three categories and one theme in each category as being relative to this phase of the ADDIE model. The themes of technology, technology support, and procedures were specifically identified by the researcher as those seen as relative to the implement phase. Technology played its part through the delivery system first and foremost. The instructors referred to the LMS they use now as ANGEL, which provides the learner with access to the

materials in the course. While in the development phase they had to create the materials and upload into the LMS, whereas in the implement phase the course and materials that were developed are accessed through the LMS by the learner. According to the instructors, the LMS also provided a communication link in the form of email and discussion boards.

Another piece of technology that has been created due to the rapid change of technology is remote access to one's computer. Fletcher explained that he talks to students to help them on the phone sometimes, but there are better ways to show students how to use the software through video demonstrations or live remote control. Fletcher stated that "there are several different new, technologies to hook up to" (184) and he added, "you can take control of their computer and walk them through it" (184-185). This is a method of assisting students during the implement phase that is much more helpful than simply giving written directions or talking on the phone. For example, by taking control of a computer while a student is sitting in front of it, the instructor can show the student exactly how to execute a procedure that the student might not have understood otherwise.

Technology support is one of the themes in the category of support that also related to the implement phase. It was important in the development phase as instructors would sometimes need help when they were trying to create materials, however the implement phase required technology support when things did not execute properly or when students had issues on their end. Fletcher elaborated on this topic when asked about helping students with technical issues:

> Yeah, the big challenge for most of these folks is to download the software and get it installed on their computer. That's the biggest thing right now. You've got somebody who wants to do drafting ...but they live in Montana. You don't necessarily know what computer skills that person has. (195-198)

Fletcher mentioned that there is an assessment (READI) that students are encouraged to take that is provided online through the Georgia Virtual Technical College (GVTC) website that shows how ready the student is for an online course. However, this is not a required assessment according to the GVTC website.

Thierry contributed data on this theme as well in support of the relationship to the implement phase of the ADDIE model. His comments (91-93) tell the reader that while they had to do problem solving on their own most of the time, they did consult staff that had expertise in technology when needed. The experiences related to technology support during times when the course was already live are perfect examples of what might happen during the implement phase.

Data analysis also points to the theme in the category of freedom called procedures for the implement phase. This freedom in the form of procedures gave the instructors opportunities to implement the online program however they saw fit. The instructors gave the impression that this implementation of the online program and the individual courses were much less of the launch type of implementation and definitely more of a field test. Like in the design phase, the instructors could do whatever they thought needed to be done to provide effective learning opportunities for the learners.

Greg's comments typified this theme as he discussed that he did what he needed to do since he was pioneering the project (90-91). He explained that things would change during the live course as it was being taught in order to overcome unforeseen barriers. Fletcher (287-288) indicated that since they were setting the procedures, they were allowed to make changes on the go in order to seek improvement. Thierry added, “We also were thinking about getting feedback from the students to make improvements as we progressed” (141-142) and that “This part [online student feedback] helped us quite a lot” (142). The freedom to use their own procedures for

doing things like changing the materials or the methods in mid-course was something that seemed to help strengthen the program according to the instructors. All of these experiences are typical of what might happen in the implement phase of the ADDIE model since the courses were live. The feedback from the students also bridges into the last phase of the ADDIE model known as evaluate.

Evaluate

The evaluate phase can be approached in two different styles. In one approach, the evaluation is an ongoing phase that intertwines itself within each of the other phases and allows adaptation throughout the entire process (Allen, 2006). The second more rigid approach is one that follows the other phases as they were originally created without modification and shows whether the project has been successful at the end based on earlier created criteria (Gagne et al., 2005; Visscher-Voerman & Gustafson, 2004).

The data indicates that all of the categories and many of the themes have been identified in this study are related to the evaluate phase of the ADDIE model. This is especially true when one considers that the first approach described above in the evaluate phase most closely resembles the experiences of these instructors. They were not following a rigid routine that only allowed for evaluating their work at the end. The instructors were constantly making improvements and seeking feedback throughout the entire process.

As indicated in the discussion supporting the relationship of the theme of procedures to the implement phase, Thierry reported (139-143) how they sought feedback and used it during the course to make improvements to the materials and methods they were providing. This happened because they were not waiting to evaluate how things worked after the course had

finished. Instead, they were flexible and proactive in their approach so that modifications could change the outcome of the course.

Examples of the theme of technology within the category of rapid change that related to the evaluate phase of the ADDIE model were evident throughout the data. A specific unit of data from Greg's interview (16-19) that supports this claim contains his explanation of how he had students contact him using a beeper in the early days. He encouraged the students to contact him frequently since the delivery system was somewhat experimental at that point. Greg was able to immediately make changes and respond to problems based on interaction with the students. This was a great example of an intertwined approach of the ADDIE phases since he was actually evaluating how his materials were functioning during live coursework.

Technology was immediately tested and evaluated in both the development phase and the implement phase according to the instructors. Fletcher explained how things did not always go as planned and some problem solving had to take place to evaluate why the plan did not work. The data pointed to the fact that the rapidly changing technology the instructors used allowed them to know immediately in some cases whether their plan would work or not, such as when files that were created had technical difficulty when previewed from within the LMS.

Greg's interview provided a specific example of a unit of data (113-117) that also supports the theme of administrative support as it relates to the evaluate phase of the ADDIE model. This particular discussion implies that the administration wanted to see results such as an increase in online enrollment. Greg believed the desire of the president at that time was to be the first to get the program online in order to take students that might have enrolled elsewhere. As discussed before, the support of the administration was an indirect involvement.

This relates to the evaluate phase indirectly as well, but it does indicate that the administration participated in the evaluation of the program. However, they perhaps used different criteria to evaluate the program than the instructors were using. For example, the instructors were finding ways to test new and innovative methods to deliver instruction and constantly evaluated how these methods worked during development and implementation. However, the president seemed to evaluate in terms of how many students could be added to the college enrollment count.

Greg's interview contained a discussion (33-42) that provides data in support of the relationship of the theme of student time to the analyze phase as well as the evaluate phase. This discussion explains one of the problems the drafting program faced was the fact that they were losing students before graduation to the job market. It was explained that using online coursework provided a solution to this problem. The needs analysis of the given problem, which takes place in the analyze phase, resulted in the solution to the problem. However, the methods and materials used to pursue this solution constantly changed and were under evaluation by the instructors. It should also be noted that the completion rate still had to be evaluated each year from an administrative point of view.

Summary

This chapter presented the findings of the study by bringing forth the quotes from the interviews that were relevant to the guiding research questions. The three participants, Fletcher, Thierry, and Greg were very generous with their time and information as they shared their experiences and knowledge of the online drafting program. Rapid change, support, and freedom were the emergent categories presented in this chapter that were the result of the data analysis. The constant comparative method of data analysis was used in this study.

The themes within the category of rapid change were identified as technology and the tools of the trade. The themes within the category of support were identified as administration and technology support. The themes of freedom from procedures and student time emerged within the category of freedom. The discussion of these themes served as the vehicle to provide a description of the experiences of the instructors as they created and maintained the online drafting program.

The ADDIE model of instructional design was utilized to show the relationship of the experiences described to each phase of ADDIE. A description of each phase of the model was provided in the discussion as found in the literature. The specific units of data found in the interview transcripts were provided in support of the claims that experiences were related to the individual phases of the ADDIE model. The following chapter contains a discussion on why these findings are important, a discussion on implications for practice, and suggestions for future research.

CHAPTER 5

CONCLUSIONS, DISCUSSIONS, AND RECOMMENDATIONS

Introduction

The purpose of this qualitative study was to describe the experiences related to the creation and maintenance of the online drafting program through the eyes of the drafting instructors involved. The data in this study was collected through interviewing the three people that created and maintained the online drafting program. Two of the three participants continue to create and maintain the program as instructors, while the third participant was the original creator and no longer works at ABC Technical College. These participants provided thick and rich descriptions of their experiences to provide data in this phenomenological study. This chapter presents conclusions, discussions, and recommendations based on the data analysis and the researcher's interpretation.

Conclusions and Discussion

Purposeful sampling instead of random sampling was utilized in order to gain the information relevant to this study. A qualitative study typically provides findings that are a glimpse into the experience of one person, or many people. Therefore, the reader must determine how these findings may relate to a similar situation before making a blanket conclusion or over generalizing. This would not be the intention of the qualitative study as the purpose was to describe the experiences related to the creation and maintenance of the online drafting program.

The items that emerged from the data analysis help to answer the guiding research questions, which were:

1. How do the drafting instructors of the online drafting program describe their experiences when designing instruction for an online drafting program in a technical college setting?

2. How did the lived experiences of the drafting instructors relate to instructional design processes in the development of the online drafting program?

The first question was addressed throughout Chapter 4 as the experiences of the instructors were presented in detail through quotes from the interviews. These quotes were arranged in a way that demonstrated how they supported the emergent categories and themes that were identified by the researcher through the constant comparative method of data analysis. The themes within the category of rapid change were identified as technology and tools of the trade. The themes within the category of support were identified as administration and technology support. The themes of freedom from procedures and for student time emerged within the category of freedom.

The researcher used these categories and themes throughout Chapter 4 as a tool to organize the data into a manageable format. The categories and themes represent the experiences of the instructors and were utilized by the researcher to describe those experiences that were relevant to the guiding research questions. Individual quotes from the transcribed interviews were brought forth as examples in support of the themes and categories and put into context to better understand the experiences of the instructors.

After providing a description of the experiences, those experiences were utilized to address the second research question. Table 4 in Chapter 4 was developed to illustrate the relationship of the various categories and themes to the ADDIE model. As previously discussed, the acronym ADDIE stands for the most common phases involved in instructional systems design, which are Analyze, Design, Develop, Implement, and Evaluate. Each phase of the ADDIE model was discussed in terms of how it related to the experiences of the instructors. A

letter X on Table 4 indicated a relationship between a certain phase of the ADDIE model and the corresponding theme, whereas the letter O indicated no relationship.

The reader might wonder why there were any Os in the table at all. In other words, every single theme did not show a relationship to every single phase of the ADDIE model. However, it is not a good thing or a bad thing that the entire table is not filled with Xs. The reason for this is that it is actually surprising how many supporting units of data were found to relate to individual phases of the ADDIE model. One must consider that the categorized themes represent the experiences of the instructors as they created and maintained the online program. It would not be logical for every experience that was described to be relative to every single phase of the ADDIE model. Therefore, it was actually expected that there would be some Os in the table.

The meaningful conclusion that can be taken from this data is the fact that the sum of the experiences support the ADDIE model as a whole. The collective experiences all provided a range of different kinds of work that had to be done to create instruction for the online drafting program. When one studies a single experience, it might relate to only one phase of the ADDIE model. However, when all of the experiences are taken into account, the relationships to the ADDIE model begin to reveal themselves. This conclusion would not be very surprising if the participants had been from an educational background.

These instructors were content experts in the field of drafting without a background in education or curriculum design. They actually went into a totally new line of work when they started working at the college. One could say they were unaware of the potential obstacles as they took on the challenge to create and maintain an online program of study. This study can be important in that others do not have to go into such a challenge unaware of all of the roadblocks and unknowns. The following table illustrates how the statement of the problem, the elements of

conceptual framework, the research questions, interview questions, findings, and implications for the problem all relate to each other to provide an overview of the study.

Table 5: *Overview of the Study*

Statement of the Problem	Elements of Conceptual Framework	Research Questions	Interview Questions from Appendix E	Findings	Implications for the Problem
The problem this study aimed to address is the lack of distance education research in career and technical education. The research is needed for instructors to utilize as they attempt to address the pressure that colleges face to provide online education.	Instructional Design Using ADDIE: Analyze Design Develop Implement Evaluate	1. How do the instructors describe their experiences when designing instruction for an online drafting program?	Questions 1-15 all aim to bring forth the experiences of the instructors when designing instruction for the online drafting program.	Rapid Change of 1)Technology 2)Tools of the trade Support by 1)Admin. 2)Technology Freedom from 1)Procedures 2)Student time conflicts	Described experiences provide the reader with important data to consider when designing instruction for online technical programs.
		2. How did the lived experiences of the instructors relate to instructional design processes in the development of the online drafting program?	Questions 1-7 specifically address experiences that relate to instructional design. These could include all components of ADDIE.	The range of experiences provided examples of every phase of the ADDIE model.	Instructional design found in the experiences provide research that can be utilized as an example of distance education in technical studies.

A discussion on how this illustration provides an overview of the study is necessary at this point. The problem this study aimed to address is the lack of distance education research in

career and technical education. The research is needed for instructors to utilize as they attempt to address the pressure that colleges face to provide online education. This statement of the problem was addressed by using the conceptual framework (ADDIE) to run in the background of the study. In other words, these common phases of an instructional design model are the criteria from which the data is compared in order to formulate conclusions. The entire time the data is analyzed, the phases of the ADDIE model are being utilized to cross check experiences described by the instructors.

In order to obtain data to analyze that is relevant to the problem statement, the research questions were developed to bring focus to the study. Interview questions were then created with the problem statement and research questions in mind. These questions aimed to probe into the experiences of the instructors as they created and maintained the online drafting program under study. During the interviews and during the analysis of the data, the ADDIE framework was running in the background to guide the researcher.

The first research question sought to get a description of the experiences, which are listed as categorized themes in the findings column of Table 5. The second research question sought to discover whether the experiences were actually related to the ADDIE model or not. As indicated in the findings column for the second question, the range of experiences provided data that did indeed show support of each phase of the model. The last column illustrates the implications of the findings on the problem statement.

Since the problem is the fact that there is a lack of research on distance education in technical studies, these findings directly address this lack of research by providing a real example of an online program of study in regards to faculty choices and experiences. The problem also indicated that there is pressure to provide distance education. This means that

faculty members are possibly facing the demands of creating distance education versions of their traditional on campus based programs without any experiences from which to relate. The implications of the findings from this study give the reader descriptions of experiences that are related to this problem. The findings also showed that the described experiences were related to the most common phases of instructional systems design known as ADDIE.

While this study is a glimpse into the experiences of three individuals, there are many items that were described that could provide some transfer of knowledge. The reason that the second question and the implications of the findings are significant is because the experiences were found to actually describe aspects common to instructional systems design. If the experiences described were totally unrelated to any of the phases of the ADDIE model, then one would have to wonder how exactly these instructors were able to design an instructional system at all. If this were the case, then the experiences might not have been very helpful to the faculty member looking for an example from which to gain a transfer of knowledge.

It is very possible that these instructors have no idea what an ADDIE model is. It is possible that they would have been more organized in their approach to creating instructional materials if they were familiar with instructional systems design. It is also possible that they would have done everything essentially the same. These two scenarios could go either way because there is not a perfect amount of work that falls into every phase of the ADDIE model. It is up to the individuals to evaluate their own situation to determine what, if anything needs to be modified. This is one view of why the ADDIE model is so flexible; it can allow for constant change with the ultimate goal of improvement in mind.

This implies that it does not really matter how much designing the instructors did in the design phase of the ADDIE model. The judge of how much is enough will be determined by the

instructor. An instructor may have to go back to designing in mid-development when issues arise and that would be a normal event when creating materials for instruction. The entire process is not perfectly situated every time. However, this does not imply that one should start developing materials if there has been zero design time or zero needs analysis time spent. This would be similar to building a house with no plans or understanding of what needs the house should provide to the potential owner.

Implications for Practice

Burke (2002) reported that there has been pressure added to colleges to battle in the distance education market for students. This has resulted in increased numbers of online courses and programs across the nation (Burke). The problem this study aimed to address is the lack of distance education research in career and technical education. The research is needed for instructors to utilize as they attempt to address the pressure that colleges face to provide online education.

Faculty members have to make choices about instructional design in order to deliver distance education curriculum in career and technical education. This study is not intended to provide a best practices manual or a step by step instruction manual for creating online education in the area of technical education. However, this study is a glimpse into what real instructors experienced as they had to create and maintain online courses for an online program of study in drafting.

As mentioned before, the reader must not over generalize about the findings of this study. One must think about the situation in this study and make the determination if these experiences are relative or transferable to another similar situation. It is possible to learn from the experiences of others, especially to gain insight into a topic that is unfamiliar (Merriam, 2002; Patton, 2002).

This study could provide a transfer of knowledge to help make decisions about programs that seek to move to the online delivery format or that are currently taught in the online delivery format. More specifically, educators or administrators that would like to utilize online means to deliver technical education in areas such as drafting can use this study to perhaps gain insight into this particular phenomenon.

The first point that one might take into consideration when looking at the data from this study is the fact that there is a plethora of technology utilized in an online course or an online program of study, especially one that involves technical education. Fletcher summed it up nicely when he said "… if you aren't computer savvy you can forget it" (340-341). There are many instructors out there that may be interested in moving courses to the online delivery system or that may be told they need to do so by a higher authority. However, the data indicates that there is a high level of technical ability needed to create materials and to maintain courses.

There is literature that supports this finding as well (Palloff & Pratt, 1999). Anderson and Middleton (2002) wrote about how the daunting task of creating materials for online instruction can be complex and highly technical, which can leave a feeling of confusion and intimidation for those that are not as familiar with technology. Technology is not something that everyone is comfortable with and unfortunately can easily frustrate users. Problem solving the technology and having patience when the technology does not work the way one thinks it should is something to consider according to this study.

The data indicated technology support could prove to be essential for the instructor attempting to create instruction for the online delivery mode. This finding also has been supported in the distance education literature for online coursework (Boettcher & Conrad, 2004; Pallof & Pratt). The participants mentioned that technology support was not always there when

needed, but it helped tremendously when it was available. This technology support was not always given by the technology staff at the college. As an alternative, the support was given from any person that could help. The instructors also admitted that they had to serve as technology support for students and for each other.

This study pointed to the fact that administrative support was essential in the creation and maintenance of the online drafting program. This support came in the form of encouragement as well as in the form of financial backing. The instructors explained that they always had the equipment and training that they needed thanks to the support of their administration. There is literature that supports this concept of administrative support as well. For example, McAlister, Rivera, and Hallam (2001) reported that the administration will have the ability to both influence potential participants and secure resources needed to successfully implement such a project. Bothel (2001) wrote that the plan must have every administrator committed in order to go in a forward direction with distance education. The implication for practice is straight to the point in this case; make sure the administration is behind the project to move the program or courses online before taking it on alone.

The data shows that drafting students would leave the traditional on campus drafting program to work in field before they had actually finished the whole program of study. While it was good for the job placement rate of the program, it was at the same time lowering the program completion rate. The idea of having students take the courses online solved the problem by allowing the students the freedom to work on their coursework without having to be in class at a scheduled time. An instructor or administrator may consider starting an online course or an entire program of study in order to solve an issue similar to the one solved in this study.

The data reflects that these instructors had freedom from restrictive procedures. They had the freedom to do whatever they wanted. However, they also did not have much guidance. This was especially true in the beginning but as time progressed the instructors have been given what is called a Quality Assurance Manual. The data did not indicate that this caused any issues for the instructors; instead it was viewed as a tool to help them to improve.

This Quality Assurance Manual is considered to be a tool for colleges to provide evidence to accrediting bodies that the online coursework is the equivalent to any traditional coursework in terms of meeting standards set by the state and college. In other words, the colleges must show that their online courses meet certain aspects of quality and are as good for the student as the traditional on campus courses. The implication for practice on this topic is that the instructor must find a way to allow for creativity while meeting the specifications of quality set forth by the state and college. The college should provide training and documentation to guide the instructor with respect to the quality specifications.

Suggestions for Future Research

The following suggestions for future research that are provided below could further the understanding of this phenomenon. These suggestions are based on the findings from the data analysis, the conclusions and discussion, and the implications for practice.

1. This study focused on one college's online program and instructors. More studies that seek to explore the experiences of instructors as they face the task of creating and maintaining online coursework or entire programs in technical areas are required. This larger pool of data would help to provide research to aid in the demystification of creating online coursework in technical program areas. As there is more pressure to

compete in the distance education market for students, this will be essential to those educators that need help.

2. The second research question in this study sought to discover whether or not the experiences of the instructors were relative to the most common phases of instructional systems design known as the ADDIE model. Does every person naturally work through phases such as described by the ADDIE model or did this study happen to have a group of instructors that did this by chance? More studies that aim to discover if this is true for other programs of study where instructors are creating methods and materials for instruction would be insightful. Such studies could inform the theoretical literature on instructional systems design models.
3. The data indicated that many students are taking online courses and that the instructors have no way of knowing if the students have the technical skills to be successful in the online environment. The READI assessment is provided free through the GVTC; however there is no requirement for students to complete the assessment. It is possible that this assessment could provide improvement for the program and possibly for all online courses and programs if the students could be aware of and address their technical skill level. It is understandable that colleges do not want to deny any student of the opportunity to take online courses, however the student should be required to have a minimum skill set in order to enroll in an online class. If not, the student could be setting himself up for failure. A study to assess pre-requisite technical skills and the relationship to the student's success of the online course could help address this problem.

4. Results of this study indicated that technology and technology support play a vital role in the instructional design process for online coursework. Technology is much too broad of a term to use if users want to know exactly what they need to understand before taking on the challenge of creating online coursework. A study of specific skill sets that instructors must possess would aid in faculty training for online education.

Summary

This study sought to bring forth a description of the experiences relating to the instructional design process in the creation and maintenance of the online drafting program under study through the eyes of the drafting instructors involved. A qualitative design methodology was utilized in this study in order for the researcher to properly describe these experiences. Qualitative research relies on interpretation of such things as interviews and written information that describe a phenomenon (Auerbach & Silverstein, 2003). The phenomenological approach as described by Patton (2002) and Merriam (2002) was specifically used to shape the process of the research methods in the field. Interviews were conducted as the primary method of data collection and were considered the most appropriate method to describe the lived experiences of the drafting instructors.

The three participants in this study were Thierry, Fletcher, and Greg. They directly created and maintained the online drafting program. These three participants were chosen using purposeful sampling instead of random sampling, which is consistent with qualitative research as it allows the researcher to focus on participants that will provide the most relative data to the study. The thick and rich descriptions of the experiences given by the participants allowed the researcher to describe the phenomenon of the online drafting program of study. The researcher organized the data from the transcribed interviews by coding the units of data into categorized

themes. These themes allowed for an organized presentation and description of the experiences, thus answering the first research question.

The researcher used the ADDIE model as the conceptual framework in this study by cross referencing the experiences of the instructors with the individual phases of the model. It was interpreted that the experiences were relative to the phases of this model. This was presented through discussing how the emergent categories and themes from the data analysis were associated to each phase of the ADDIE model. This association answers the second research question and allows for discussion and conclusions to be drawn as to what importance this study holds for the educator or administrator.

Much can be taken from the experiences of others as the reader can learn from the mistakes and the victories. The findings in this study suggest that the experiences of the instructors can give the reader several implications for practice, such as how important technology skills and technology support will be in order to create and maintain materials for online instruction. Other implications included the importance of administrative support and the ability of online education to solve time and distance barriers for students. The findings also suggest that instructors, whether they know it or not, are utilizing instructional design methodologies to some extent when they create the materials and methods for online coursework.

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APPENDICES

APPENDIX A: IRB APPROVAL

PROJECT NUMBER: 2010-10260-0
TITLE OF STUDY: A Phenomenological Study of Drafting Technology Instructors from an Online Program of Study in a Technical College Setting
PRINCIPAL INVESTIGATOR: Dr. Clifton L. Smith

Dear Dr. Smith,

Please be informed that the University of Georgia Institutional Review Board (IRB) reviewed and approved your above-titled proposal through the exempt (administrative) review procedure authorized by 45 CFR 46.101(b)(2) - Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, /unless:/ (i). the information obtained is recorded in such a manner that human participants can be identified, directly or through identifiers linked to the participants; /and /(ii). any disclosure of the human participants' responses outside the research could reasonably place the participants at risk of criminal or civil liability or be damaging to the participants' financial standing, employability, or reputation.
Please remember that no change in this research proposal can be initiated without prior review by the IRB. Any adverse events or unanticipated problems must be reported to the IRB immediately. The principal investigator is also responsible for maintaining all applicable protocol records (regardless of media type) for at least three (3) years after completion of the study (i.e., copy of approved protocol, raw data, amendments, correspondence, and other pertinent documents). You are requested to notify the Human Subjects Office if your study is completed or terminated.
Good luck with your study, and please feel free to contact us if you have any questions. Please use the IRB number and title in all communications regarding this study.
Sincerely,

LaRie Sylte, M.H.A, M.A., CIP
Human Subjects Office
University of Georgia
www.ovpr.uga.edu/hso/

APPENDIX B: CONSENT FORM

I, _____, agree to participate in a research study titled "A PHENOMENOLOGICAL STUDY OF DRAFTING TECHNOLOGY INSTRUCTORS FROM AN ONLINE PROGRAM OF STUDY IN A TECHNICAL COLLEGE SETTING" conducted by Michael Fennell from the Department of Workforce Education at the University of Georgia (423-322-2820) under the direction of Dr. Clifton Smith, Department of Workforce Education, University of Georgia (706-542-4208). I understand that my participation is voluntary. I can refuse to participate or stop taking part at anytime without giving any reason, and without penalty or loss of benefits to which I am otherwise entitled. I can ask to have all of the information about me returned to me, removed from the research records, or destroyed.

The problem that this study aims to address is how faculty choose to use distance education in the field of career and technical education. If I volunteer to take part in this study, I will be asked to do the following things:

1) Answer questions and discuss experiences about the online drafting program which will take approximately 1 hour.
2) Someone from the study may call me or email me to clarify my information or experiences.
3) Possibly provide documentation pertaining to the online drafting program that could further describe or illustrate the choices made in the use of distance education.

The benefits for me include the opportunity to share my experiences and choices that I made about distance education in the online drafting program of study.

No risk is expected from participation in this study. Furthermore, the name of the college and names of the participants in the study will remain confidential as pseudonyms will be used in the research.

No individually-identifiable information about me, or provided by me during the research, will be shared with others without my written permission, except if it is necessary to protect my welfare (for example, if I were injured and need physician care) or if required by law. The interviews will be recorded with an audio device and destroyed within 6 months of the completed study.

The investigator will answer any further questions about the research, now or during the course of the project.

I understand that I am agreeing by my signature on this form to take part in this research project and understand that I will receive a signed copy of this consent form for my records.

_____	_____	_____
Name of Researcher	Signature	Date

Telephone: _____
Email: _____

_____	_____	_____
Name of Participant	Signature	Date

Please sign both copies, keep one and return one to the researcher.

Additional questions or problems regarding your rights as a research participant should be addressed to The Chairperson, Institutional Review Board, University of Georgia, 612 Boyd Graduate Studies Research Center, Athens, Georgia 30602-7411; Telephone (706) 542-3199; E-Mail Address IRB@uga.edu

APPENDIX C: PARTICIPANT DATA SHEET

Age:

Number of years teaching:

Number of years worked in drafting industry:

APPENDIX D: CODING SCHEME

- Rapid Change
  - Technology
  - Tools of the trade

- Support
  - Administration
  - Technology support

- Freedom
  - Procedures
  - Student time

APPENDIX E: INTERVIEW GUIDE

1. Describe the experience of adapting/creating the drafting curriculum to an on-line environment for adult learners.
2. Describe how this work was accomplished.
3. Was there any particular curriculum procedure that was used to make this conversion?
4. Describe how you came to the decision to start an online drafting program of study?
5. Describe your support system in this process, such as others who played a role in this process.
6. Describe a typical group work session.
7. Describe a typical individual work session.
8. What was it like when you did independent work?
9. Was it easier to work in groups? Why? Why not?
10. Was it easier to work as an individual? Why? Why not?
11. What were the interpersonal dynamics that impacted on the work group?
12. How did you feel about this process?
13. How did you and your colleagues react to these procedures?
14. What went wrong? (Roadblocks from administration? The System Office?)
15. What went right?