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Planning For The Future: Florida Community Colleges' Preparations For The Advent Of High Definition Television

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PLANNING FOR THE FUTURE: FLORIDA COMMUNITY COLLEGES' PREPARATIONS FOR THE ADVENT OF HIGH DEFINITION TELEVISION

by

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ABSTRACT

Throughout the literature, researchers reported on the problems that post-secondary institutions have had with technology(Birchard, 2001; Green, 2003; Starrett & Rogers, 2003;). Given limited budgets and the need to train faculty and staff, many colleges have struggled to find a way to use technology to enhance, not hinder, pedagogy (Cuban, 2001; Oppenheimer, 2003). This study was conducted to examine the impact of the federally mandated change in the television standard to high definition television (HDTV) on Florida's community colleges.

Surveys were sent to the chief technology officers of the 28 community colleges in Florida. Additionally, eight interviews were conducted in five of the institutions. From both the qualitative data and the quantitative data, a picture emerged of the institutions and the conversion status. Of the 17 survey respondents, 11 reported no plans for conversion. Of those that did have plans for conversion, few concrete details were reported. Instead, the representatives of the institutions seemed to believe that it was not necessary to make plans for the change to HDTV.

Costs represented the major concern of the survey respondents with implementation and training listed as the second and third most important issues. Many participants from the community colleges had some thoughts about HDTV, but these were more on the departmental level rather than college-wide.

HDTV was projected to become the television standard in February 2009. The long lead time on this innovation should have provided community colleges with time to plan. As revealed, however, community colleges in Florida failed to plan for change.

To my son, John, truly my gift from God.

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CHAPTER 1
THE PROBLEM AND ITS CLARIFYING COMPONENTS

Introduction

The Federal Communications Commission (FCC) has mandated that on February 17, 2009 the broadcast video standard in the United States will shift from the analog National Television Standards Committee (NTSC) standard, also known as standard definition, to a digital television signal as part of a move to High-Definition Television (HDTV). The FCC has stated that the conversion will primarily come about for two reasons: (1) to improve the quality of the television image and (2) to free up bandwidth needed for other uses (FCC, *Digital Television Basics*). This conversion will affect any and all broadcast facilities, but will also render current analog video tape recorders, analog videotapes and most television sets obsolete as the new digital format is generally not compatible with the older, analog format. As part of the FCC's third periodic review involving digital television, the commissioners released a statement saying, "We recognize that the transition is a complex undertaking presenting many challenges to the broadcast industry" (Federal Communication Commission, Third periodic review).

But it is not just the broadcasting industry that will face challenges. For higher education institutions, the conversion may bring about many concerns and problems. One of the country's largest retailers of electronics, Best Buy, eliminated analog television from it's inventory in October 2007, saying that it was "signalling the end of an era as consumers increasingly move toward digital products" (MSNBC). As a result, replacing analog equipment may no longer be an option and the cost of buying new digital

equipment can be an expensive proposition. But for community colleges, with their historical mission of serving their communities, the conversion may cause a larger problem. The Florida Department of Education in their 1998 strategic plan listed as one of the principles of community college education, the use of "all providers and modes of delivery for instruction" (Florida Department of Education, p. 5). The impact will be particularly felt at the community college level because many institutions rely on local broadcast television to carry course content out to the communities and use video equipment such as video cassette recorders (VCR) and television sets in the classroom. Additionally, learning resource centers and departments that are heavy users of video will also feel the effect.

In order to have a smooth transition from one format to the other, community colleges should prepare to deal with the conversion. The question was, as the time grew shorter till the change in format was to take place, as to the preparedness of institutions. The best preparation would most likely include steps such as formulating an implementation plan, assigning leadership roles and responsibilities to various individuals and teams, creating an informational and training program, and planning for the budgetary impact that conversion will bring. As with any change, persuading various members of the community college organization to accept and use a new technology has the potential to create a backlash against the technology and to distance the individuals and even groups from those who are implementing the technology (Vaughan, 2001). For those who have not yet initiated planning at their institutions, a study such as the present

study can be useful in learning the extent to which others have been successful or encountered problems.

Generally, the rate of change associated with technology presents problems. In terms of computer technology the almost overwhelming speed of improvement has been phenomenal. Moore (2003), the co-inventor of the microchip and co-founder of Intel, predicted in 1965 that computer speed would double about every eighteen months, a statement that is now referred to as "Moore's Law." Figure 1, based on information retrieved from the Intel website, illustrates this exponential growth pattern. The X axis shows the Intel processor and the year of release while the Y axis represents the number of transistors per integrated circuit.

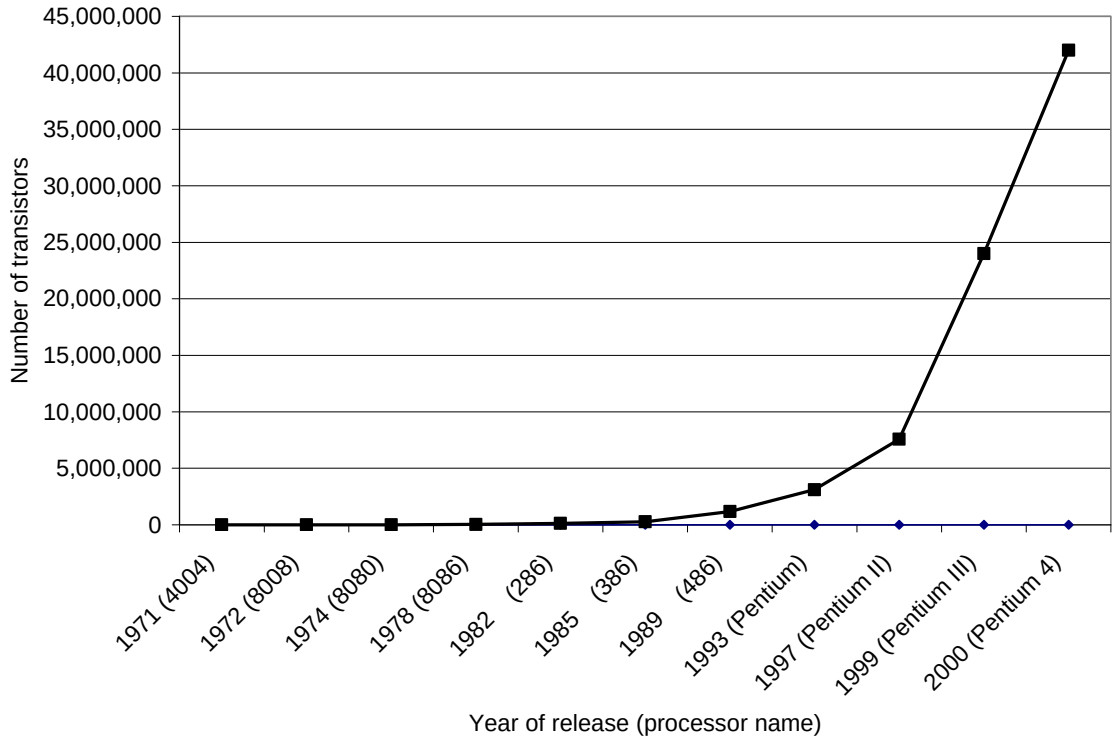

Figure 1. Moore's Law illustrating the increase of processor speed

Even though this figure compared only the speed of the Intel processors, other computer chip manufacturers have followed a similar line in the improvement of computer speed. More computer speed, coupled with greater storage capacity, has created a situation where the ability of a computer to handle information and therefore to do more has grown exponentially. Computers have increased in speed and size and other types of technology have evolved as well. As technology changes, the people working with the technology must update their knowledge. This sets up a system where training is not a "once in a while" situation but an almost constant process as technologies change at a faster and faster rate. Argyris (1998) stated that professionals can feel very threatened when they realize that their own level of learning is not up to standards. Quickly, those people who were hesitant to use technology at the beginning can find themselves falling farther and farther behind even as they struggle to keep up, creating what might be considered the Alice-through-the-looking-glass effect of having to "run very fast just to stay where you are."

Digital television is an example of a technological change that has had a significant lead time. The first ruling from the FCC on the issue of a new television standard was in 1987; the FCC began to examine the issue of digital television in 1991 (Barlow, 2005). Therefore, institutions have had an enormous amount of time to plan for the changeover. This study was conducted to determine the extent to which community colleges had used this planning time that had been made available to them.

The differences between one piece of technology and another have not always been clearly articulated. In terms of digital television, some of the differences between

the current NTSC standard and the new HDTV standard fall into three basic improvements: aspect ratio, resolution and digital signal (FCC, *Digital Television Basics*).

Aspect ratio is the general proportions of the screen. It has generally been stated as the ratio of the height of the image to the width of the image. The difference in two measurements results in an image that more closely resembles a square or a rectangle. Ascher & Pincus, (1999) stated the original aspect ratio of the silent films was known as Academy and had the proportions of 1.3:1. The film images began to expand horizontally eventually reaching 2.35:1 with Cinemascope technology. Currently most films are shown in theaters at the widescreen aspect ratio of 1.85:1. The reason behind this move to a more rectangular scope of the image had to due with human vision. With the placement of human eyes side-by-side, human vision naturally has a wider field of vision on the horizontal plane than on the vertical plane. Audiences felt more involved in films when they were shown in a wider aspect ration because the more rectangular image filled more of the human vision field (Ascher & Pincus). In order to move the video image along the same evolutionary path, HDTV was created with an aspect ratio of 16:9 which has a more rectangular image than the current NTSC aspect ratio of 4:3.

Resolution refers to the fineness or sharpness of the image and is most clearly seen in the ability to record fine detail. Ascher and Pincus (1999) explained that the television screen is comprised of pixels, short for picture elements. Each pixel is a small square that receives a signal that details the luminance or brightness of that pixel and the chrominance or color of that pixel. The NTSC standard used 525 lines of pixels down the

screen; HDTV used 1050 (as configured for Untied States broadcast). Of these lines of pixels, only a portion were used to produce the picture; the remaining lines were used to contain various signals such as closed captioning or emergency broadcast signals. For NTSC, this meant that only 484 were considered active lines while HDTV contained 960 active lines. HDTV then had the ability to produce a picture with more than twice as many active lines. More lines of pixels meant finer details in the image (Ascher & Pincus).

Finally, HDTV has been configured to be a digital signal. Although it was not initially conceived of as digital television, advances in technology made that possible. The differences between an analog television signal and a digital one are many but there are a few differences that are particularly noteworthy. When an analog signal is copied, the process creates a dub and is considered to be one generation down from the original. This means there is some loss of quality from the original to the dub. The amount of loss depends on many factors including the type of video equipment used to originally capture the signal and then transfer it to the copy. For digital signals, the copy of the original is called a clone because it is identical to the original signal. Also, digital signals can be captured into computer equipment for editing and other post-production tasks while analog signals cannot without first being digitized.

Despite a campaign by the FCC to hasten the change, the history of digital television has been one of missed deadlines and misconceptions (Alvarez, Chen, Lecumberri, & Yang, 1999). The NTSC television standard has been in effect in the United States since the beginning of television broadcast. The standards have been

unchanged except for the addition of color signal in late 1950s. As the rest of the world adopted television, the broadcast standards around the world were steadily advanced beyond the NTSC standard. For example, NTSC used 525 lines of resolution; that is, there are 525 rows of pixels available in the screen from the top to the bottom. The two systems commonly used throughout Europe used 625 lines of resolution; therefore, most European countries have been viewing a television picture with greater resolution than those seen in the United States (Ascher & Pincus, 1999). One of the European systems, Phase Alternating Line (PAL), was adopted by Great Britain in 1967. So advanced systems were available for many years but the cost of implementation was overwhelming.

As more countries adopted broadcast systems other than NTSC, the FCC began to look at advancing the NTSC standard. In 1987, the FCC began the work of looking for an upgraded standard at the demand of broadcasters within the United States (Alvarez et al). Due to limitations imposed by terrestrial broadcasting methods, there was doubt that a digital system could be implemented. As the committee established by the FCC worked on the problem, developments in satellite and cable broadcast made digital television possible. In 1990, the FCC favored a system where television shows would be simulcast in both a digital format and in the analog NTSC system (tvhandbook.com). By 1991, the FCC was looking at several proposals for all-digital broadcast systems. In 1993 and 1994, the FCC worked to get four different systems for digital television to coalesce into a single system and field testing began. The FCC prepared a timeline for implementation and in late 1995 issued a report that called for the adoption of digital television starting in

1998 within the 26 largest cities and completing in 2006. Stations were required to meet the deadlines; Failure to do so meant loss of FCC broadcast license. Consumers did not adopt HDTV at the projected rate and so the deadline for conversion was changed from 2006 to 2009. At the time of this writing in 2007, the FCC had set a deadline of February 17, 2009 for all stations to transmit a digital signal and for all analog broadcast to cease (FCC, Digital television basics).

Purpose of Study

The purpose of this study was to examine to what extent Florida's community colleges have begun to prepare for the broadcast video format change mandated by the Federal Communications Commission that will occur in 2009. The study focused on three areas of preparation: planning, personnel and budgeting. The study was a benchmark study that was focused on the time prior to the mandated 2009 change in order to see how a sample of higher-education institutions were preparing for technological innovation.

Research Questions

Following are the research questions that were used to guide the study.

1. What steps have the Florida community colleges taken to prepare for the mandated change to digital television?
2. Who has been identified within the Florida community college to assume the responsibility of dealing with the issues associated with the conversion?

3. What factors about the conversion are of most concern to the Florida community colleges?
4. What specific plans, if any do the Florida community colleges have for implementing the conversion?
5. What plans, if any, do the Florida community colleges have for educating and training faculty and staff in the new technology?
6. What projections, if any, do the Florida community colleges have of the total cost of the conversion?
7. How do people within an institution perceive the transition?

Definitions

For the purpose of this study, the following definitions have been used.

Analog: "A signal that fluctuates exactly like the original stimulus," (Zettl, 2004, p. 391).

Aspect Ratio: "The width-to-height ratio of the picture frame. Analog television uses a 4:3 aspect ratio; HDTV uses a 4:3 or a 16:9 ratio," (NCTA glossary).

Digital: "Pertaining to data in the form of digits (on/off pulses)," (Zettl, 2004, p. 393).

Federal Communications Commission (FCC): "An independent United States governing agency . . . charged with regulating interstate and international communications by radio, television, wire, satellite and cable," (FCC, n.d. Summary).

Firewire: IEEE 1394, a type of computer connection that "allows a direct digital two-way connection between DV [digital video] devices," (Ascher & Pincus, 1999, p. 26).

High-definition television (HDTV): "A television image with an aspect ratio of 16 X 9 that has a much higher resolution (1,080 visible lines) than the ordinary television (in the United States, 525 lines)," (Zettl, 2005, p. 394).

National Television Standards Committee (NTSC): An analog video format that, "uses 525 horizontal lines, scanned in an interlaced pattern," (Ascher & Pincus, 1999, p. 18).

Methodology

The research design was an emergent design using a mixed methods approach, combining a survey with interviews. The study was conducted with the approval of the University of Central Florida's Institutional Review Board (Appendix A). A survey was developed and mailed to the 28 Florida community colleges, addressed to the chief technology officer or a similar representative. The survey addressed the issues of planning and budgeting for the change and sought to ascertain the level of awareness of the issue. Respondents were asked if their institutions were (a) planning a conversion and if so, (b) to evaluate the factors of cost, implementation and training in regards to their relative importance to the institution's plans, and (c) to identify those people and groups both from the institution as well as from outside of the institution who already were or would be involved in the conversion plan. The survey was sent by United States mail

delivery and was part of a five contact package (Appendix B) designed under the principles of Dillman's (2000) tailored design method. The survey was accompanied by a stamped, return addressed envelope. A token gift in the form of a five dollar gift card for a coffee shop was included.

Follow-up interviews with some of the institutions were conducted to find out more in depth the institutional response to the conversion. Survey responders were asked if they would participate in an interview; those responding affirmatively were contacted to schedule interview time. At each institution targeted for interviews, individuals were sought to participate in the interview process. The chief technology officer or the survey responder was one category of individual selected. Another category was a budget officer or someone within the financial office of the institution who was responsible for budgeting for technology. The third category of individual sought for the interviews was an end user of technology. An example of an individual in this category would be someone whose daily functions involved technology such as a librarian, audio-visual specialist or an instructional support staff person. Other possible interviewees in this category were directors of the learning resource center, department heads of an academic program such as digital media or television production, or directors of a campus broadcast facility. Individuals in each category were asked to respond to a set of interview questions designed for that category.

Some interviews were conducted face-to-face; others were, by necessity of distance, conducted over the telephone. All interviews were conducted individually and were tape-recorded. One individual requested the interview questions in writing and

responded in writing. The written notes and tapes from these interviews were coded to ensure confidentiality and the tapes were transcribed into written form and then destroyed. All subjects were assured of confidentiality and were given a disclosure statement of the interview process in order to be able to give informed consent. Subjects were asked to sign a consent form if the interview was conducted face-to-face. For those participants interviewed over the phone, the consent statement and the consent form were read to the subject and appropriate responses were recorded. Appendix C contains the consent form and the interview questions used by the researcher in conducting the interviews.

Data were processed using a mixed methods approach of quantitative information from surveys and qualitative information from the follow-up interviews. Responses from the surveys were entered into a database using SPSS software for analysis, and descriptive statistics obtained. Some information such as number of enrolled students and annual budget on each institution was gathered from Florida's Department of Education website as well as institutional websites.

Population

The chief technology officers or similar representatives from each of Florida's 28 community colleges comprised the population for the survey. All members of the population who responded were included in the study. Respondents were asked to participate in a follow-up interview. All of the respondents who indicated a willingness to participate were contacted in order to be interviewed. One respondent who initially

offered to participate later decided not to be interviewed. Interview participants were asked to recommend others at their institutions for interviewing, and those other employees were contacted and asked if they were also willing to be interviewed. All of those contacted through referrals agreed to be interviewed. All of those who were willing to participate in the interview process were part of the interview population.

Delimitations and Limitations

The study was limited to those Florida community colleges that provided responses to the survey. All answers were assumed to be honest and fairly representative of the institution that provided them.

Only institutions within the state of Florida's community college system were sent surveys. Those institutions that were currently offering four-year degrees and were no longer called "community colleges," but which were previously called community colleges and who were still within the state's community college system were included in this study. Each institution received one survey addressed to the chief technology officer or to a similar representative. It was assumed that every institution had one person who was primarily responsible for making decisions about technology.

Significance of the Study

Higher education institutions often have a challenge in trying to stay current with changes in technology. Community colleges, with the mission of servicing their geographic area, need to use broadcast television and other video formats to deliver

content to their target populations. In the case of digital television, the change in video technology has been in the planning phase with the FCC since 1987. Therefore, colleges have had a substantial time to get ready. But many institutions may have not yet begun to make any plans for a conversion. This study examined how Florida community colleges planned for technological innovation when there was a significant amount of time prior to the change.

Given the rapid pace of technological change, digital television presents a case study unparalleled in looking at technology. Generally, change proceeds rapidly; institutions have little time to prepare a plan for conversion and have often been swept along with whatever change has occurred. Often the impact of rapid change is technology that has not served the institution well and has come with a substantial price. Digital television has been a rare example of a technological innovation that was planned over a series of years. Furthermore, since the change was instigated by the federal government, there have been many sources of information made available to institutions and a standardized format was created to make the implementation as smooth as possible. Therefore, digital television represents the best case scenario for making a technological change.

CHAPTER 2
REVIEW OF LITERATURE

Introduction

Technology has been viewed as both a curse and a blessing to education. As far back as 1962, Rudolph (1990) saw that the future of higher education institutions would be tightly bound to technology. Given the rapid pace of technology, it was no great shock to discover that many within the boundaries of higher education institutions struggle with issues associated with technology. There have been a host of problems associated with technology. There have been problems associated with the people using the technology, and there have been systems suggested to solve some of these problems. This chapter has been organized to present a review of the literature and research related to the problems, challenges and opportunities experienced by postsecondary institutions and others in their quest to integrate technology in their institutions.

Technology Defined

There are several problems that have contributed to the challenge of staying current with technology. The first problem is in defining technology. The word is used to describe everything from the simple overhead projector to the use of interactive, web-based instruction. The expertise needed for these dissimilar technologies is radically different. The amount of training needed to use an overhead is about five minutes. To design and use a web-based course, an instructor may need several weeks of instruction. As Lowry (1993) indicated, technology has really come to mean a convergence of

technologies. The definition needs to be broad enough to include hardware such as digital video cameras and scanners and software, networks and media storage. Without a comprehensive definition, an institution that is conceptualizing technology as only computers will not consider possibilities offered by smart classrooms and digital video conferencing. Perhaps the simplest definition needed is that technology involves the use of some sort of machine. A better definition may be that technology involves the use of a computer and computer-related equipment and materials.

Technology and Learning

How does technology aid learning? The answer might seem to be obvious but this question is an important one for anyone working in higher education. If the technology does not help, there is little justification in its use. Boettcher and Conrad (2004) gave three instructional strategies that were essential to learning. The three strategies were communication between student and teacher, communication between students, and communication between students and resources. Technology can abet all three. Gilbert (2003) gave examples of how technology has aided and harmed learning. He recounted a case about the use of technology that allowed a blind instructor to work with a deaf student, a situation where technology provided the solution. However, in another account, Gilbert related a story of a successful professor who was assigned to teach via video teleconferencing in order to reach a greater number of students. The professor who had received outstanding student evaluations in the classroom failed because of the very

things that made him successful in the classroom. His willingness to stay after class and casually chat with students did not translate over the video broadcast.

Poole (1997) listed the five ways that technology, primarily computer-based technology, interacted with education. The first way was learning support. Poole described this as all of the various technological methods that a learner could use to gather information, practice, simulate, communicate or study. The next way technology interacted with education was through teaching support which was all of the ways that instructors used technology to research and create materials as well as fulfilling administrative functions such as grade recording. Poole also pointed out that technology could fill a socialization function as learners shared and communicated through technology. Next, Poole credited technology with the ability to aid in integration of those students with disabilities into the classroom. Without certain types of technical support, those with physical limitations might find it difficult to keep up with a class or to interact with their classmates. Finally, Poole thought that technology allowed instructors to duplicate excellence by giving teachers a chance to use best practices that could be duplicated on media or shared through software.

Brown (2003) mentioned five ways that technology facilitated learning. The first way was that technology could give students a wider view, a greater access to more authorities and therefore provided with the freedom to explore a greater range of opinions. Brown also noted that technology allowed for individualized assignments and gave instructors a way to connect to their students on a one-on-one basis. The next advantage was that technology gave students a chance to work independently and to

expand on their capacities. Collaboration was the fourth advantage of technology due to the connectivity between students. Technology produced students who were prepared to work in groups. Finally, technology created an atmosphere where material was timely. Information could be updated daily or even hourly and students had access to the most recent data.

The advantages of technology in education were predicated on several hidden assumptions according to Sell (n.d.). One of these hidden assumptions was that information was equal to knowledge. Using Bloom's Taxonomy, Sell wrote that simple rote memory was not equivalent to meaning. The second assumption was that quality in education was a matter of providing information, and Sell charged that providing only information did not teach important concepts such as analysis or synthesis. The last assumption was that more information resulted in more learning. Sell said this assumption had a corollary stating that student interaction resulted in more learning; however, more engagement did not necessarily mean more learning was actually taking place.

Technological Innovations

In examining how technologies are accepted and used, Rogers (2003) noted five distinct stages. The first stage was awareness of knowledge. People had to perceive the innovation. In the next stage, persuasion, people needed to see how the current innovation was significantly different from earlier innovations. The third stage was the decision stage when people either accepted or rejected the innovation based on how it was

perceived. Rogers also distinguished between active and passive rejection. Rejection was active when the decider made a decision not to use the innovation. Rejection could also be passive when people did not make a decision but postponed one. When the decision stage yielded an acceptance of innovation, the fourth stage, implementation followed. Early adopters were the first group to implement. The final stage, confirmation, was not always positive. Rogers found that innovations were sometimes rejected at this stage and decisions reversed. All of these stages were significantly impacted by characteristics of the population considering the innovation. Also, the innovation had to be compatible with the population's set of values.

Technology cannot be used simply as the tool of the day. Detweiler (2004) addressed the many changes to pedagogy over the centuries. Going back into the development of universities, Detweiler noted that their very existence came about because of the need to group the technology of the day, which at that time, was books. The written resource was then a scarce one. The situation in the early 21st century was an overabundance of resources. Learning at the time of the present study was no longer bound to a particular space but has been freed to take place anywhere the student can access the information. Detweiler envisioned that this might lead to new forms of education that, in reality, were based on older forms such as peer-to-peer teaching and professorial tutorials.

Technology has changed the way that the public views education. Ward (2000) stated that colleges have based education on, "what faculty members believed students should know and how they believed that knowledge should be delivered" (p. 26). But

with the advent of technology, the public and especially prospective students often judge an institution on the amount of technology available, a visible sign of modern life. Ward also saw, as one of the fundamental shifts in education, the need for proficiency in technology but noted that few departments or programs had profoundly changed the way that they conveyed information.

The classroom has undergone a radical transformation in the last decade, a transformation fueled in large part by technology. Classrooms used to be fairly similar: tables, chairs, and chalkboard. Computers have altered the design of the classroom to the point that an instructor may feel the need to "check-out" the facility before teaching there for the first time. There is a bewildering array of possibilities. Smallen (2004) suggested a technological taxonomy. Contrasted were the technology-enhanced classroom that has an integrated presentation system running off of a computer located at the teacher's station or podium, what is commonly referred to as a smart classroom, with a technology-intensive classroom that has computers at the students' seats as well. Either type of classroom presents a formidable challenge for those professors who are not technologically savvy. For such an instructor, being confronted with the technology on a daily basis can be daunting. Teaching in such a room can require minutes of training for those proficient in technology or several lengthy sessions for those ill equipped to utilize the technology. Smallen estimated that one institution commonly spent between $50,000 and $75,000 per room for these upgrades and, therefore, had every expectation that they will be used. This has placed a tremendous burden on those instructors who do not want to use technology. They may feel that they have to learn to use it or suffer administrative

wrath. Smallen also asserted that there were two approaches to having technologically-based classrooms. One version required having the computer anchored in the classroom. This system had the advantages of ensuring instructors that the connections to the system were already in place and minimized start-up time. It also required the least amount of technical knowledge, not much beyond being able to boot up the system and run the software. The other variation required the institution to provide all instructors with laptops which they then carried into the classroom and connected to the system. This second way required instructors to know how to connect with the system but allowed them the freedom to create their materials on a computer that they knew would be available to them. More technical expertise may be needed to connect and then set the computer system preferences to ensure a proper display. However, this version also provided every instructor with a laptop to use in situations beyond the classroom and gave instructors a chance to practice with the technology without the audience of students watching.

Hype and Exaggerated Expectations

A different aspect of the problem with implementing technology has been the hype that has surrounded new educational technologies. The idea that technology would sweep through education, making instructors obsolete was a fanciful idea of the 1990s and, in part due to this proclamation, educators approached technology cautiously in many cases. Picciano (1998) charged that American education had fallen behind other organizations and institutions in the use of computer technology (p 5).

Cuban (2001) described the innovation of computers into Stanford University as the administration trying to push computers onto a somewhat reluctant faculty. He noted that the decentralized governance of most higher-education institutions meant that different departments selected, purchased and used different types of computers resulting in a lack of standards across the institution and a differential in the amounts of technology in use. Faculty members in departments that were positive about technology, had funds at their disposal and were willing to make the investment, were far more likely to have and use computers than were faculty members in poorer, less technological savvy departments. This disparity was lessened as time advanced. Still, Cuban reported that as of 1997, the technology used most frequently by instructors in a Stanford classroom was the overhead projector.

Cuban (2001), in examining the innovation of older technologies like film and television, found that while there were early enthusiastic claims about these technologies, the hype quickly died and the technology became a sidebar to the majority of classroom instruction. Similarly, Oppenheimer (2003) examined the history of technology in education and found a reoccurring pattern of excitement about a new technology and then failure to deliver on the promises. He found that technology could be a useful tool within certain limits such as appropriateness to the task and to the level of the student. Oppenheimer's chief criticism of technology, however, was that the cost of innovation often drew on funds needed for basic expenses such as infrastructure repair or salaries and that the attempt to keep up with technology often strained institutions' budgets.

Starrett and Rodgers (2003) discussed the 1990s as a time when technology was often purchased without an overall master plan, with little or no regard for the pedagogical implications, and without consideration of faculty skill levels. They also alleged that there was further confusion over how technology skills should be evaluated in tenure decisions and in conflicts over intellectual property issues. Not only was all of this new technology expensive, but in many cases it went unused. Birchard (2001) reported that a university study demonstrated that most computers were only used at a maximum of 10% of their capacity. The remaining capacity of the computers was wasted. Birchard also claimed that the pressure to upgrade existing systems was probably unnecessary. Daniel (2001) reported on a university's attempt to become a predominantly on-line institution only to find that students preferred a "low-tech" approach that included such distinctly ancient methods as reading books. Daniel did note, however, that there was a distinct tendency to "overestimate the impact of a new trend in the short term and underestimate its effect in the long term" (¶2).

As the evidence has been presented on both sides of the argument, many in education have grown wary of jumping on the technology bandwagon. Jackson (n.d.) called this technological reluctance "another trip to Abilene," a metaphor for a situation where everyone is going somewhere when they really do not want to go to that place. An example of an area of technology in education that was oversold was e-learning. Only a short time ago, promises were made that e-learning would revolutionize education. The traditional chalk and talk style classroom, where a professor lectured to a room full of dozing undergraduates, would be replaced by an exciting exchange of ideas over the

Internet. In this environment, learning would explode beyond the boundaries of the lecture hall.

Zemsky and Massey (2004) studied the whole e-learning movement and found that it was based on three basic premises. The first premise was that educators would gladly accept the changes. Instead, many educators found themselves overwhelmed by too many choices and conflicting information. The second premise was that students would readily accept e-learning since they already had a fascination with technology, but no one had any idea if that was true. Instead, Zemsky and Massey discovered that students were interested in technology in order to fulfill three functions: connection to friends, entertainment, and presentation. Beyond that, students had limited interest. The only one of these functions that easily fit into the classroom was presentation, and Zemsky and Massey found that students were adept at creating effective presentations with software. The final premise was that e-learning would revolutionize teaching and that pedagogy would undergo a radical transformation. Again, the promise did not quite live up to the reality. Professors used technology to simplify their lives but did not generally use it to teach. Instead, technology was used for record keeping, note taking and research.

Furthermore, Zemsky and Massey (2004) discovered that the technology was often adopted by a group of professors who were willing to experiment and that this attitude, particularly coupled with financial incentives lured instructors into using new technological based tools such as Blackboard or WebCT but, with the passage of time, the institution removed the financial incentives and the early adopters lost their

enthusiasm and moved on to some other new idea. Zemsky and Massey concluded that the hype surrounding new technologies was actually detrimental to subsequent innovations because faculty felt skeptical about the possible benefits.

In 2006, much of the excitement at the intersection of education and technology centered on wireless access. In 2001, Des Moines Community College had opened a new campus that was touted as one of the first completely wireless campuses. The infrastructure of the school was designed to allow instructors to use a variety of technologies in the classroom, and the stated purpose of the campus was to move past the written text and into high-end graphics and audio as major components of learning. The executive dean for the campus, Paustian, stated that, "If you put a text-based program in front of these learners, you'll bore them to tears (p. 1)" (Des Moines are community college, 2002). The basic concept was to capture what the school referred to as the gaming generation. Instructors working at this campus were expected to use a wide variety of technological tools in place of traditional lecture. How the campus will perform in future years remained uncertain at the time of the present study. As Greene (2004) stated, academia has yet to come up with valid and reliable means for testing the benefits of educational technology.

Jackson (2004) also used the idea of a "gaming generation," calling information technology "essential to virtually the nation's entire critical infrastructure" (p. 12) and requested higher education institutions create a new pedagogy. She said that institutions needed to recognize the new cognitive patterns of the generation that had grown up with computers, VCRs and video games. Jackson specified that education should become

interactive and experimental; furthermore, learning needed to move out of the lecture hall. The idea of a new type of student infecting academia has not yet been proven with any research although the idea continues to pop up in countless journal articles.

Related to the hype surrounding technology in education was the 1990s notion of the digital divide. A term coined to describe the differences between those households that had computers in the home and access to the Internet and those households that did not have these tools, the digital divide was originally posed to be the next great societal challenge. The 1999 report, *Falling Through the Net,* painted a bleak picture of an American society divided over technology. But that picture changed rapidly. In 2002, a second federal report, *A Nation On-line,* described an America where Internet usage was rapidly spreading. Revenaugh (2001) reported that between 1998 and 2000, there was a 75% increase in rural households' access to the Internet and that other areas of society were catching up as well. Similarly, Oder (2002) detailed the Federal government's retreat from the idea of a digital divide and a reduction in those programs that were designed to shrink the divide. While much of this may have been political, there was no doubt that the divide had considerably diminished due in no small part to access provided by public libraries, the drop in computer prices and the availability of technology in the educational system. However, the constant hyping of technology as the solution to long-term problems has continued.

Gender, Race and Age Factors

In addition to the problems associated with keeping track of the technology, there is the human element in technology. There are three areas that affect the way people view technology: gender, race and age. Gender differences, especially in relationship to technology, have been of particular concern over a number of years. Spotts, Bowman and Mertz (1997) summarized the research into gender differences with four general statements. The first was that there were issues concerning access to technology and performance level that privileged males. Second, the researchers noted that there was a correlation between gender and the way people learn to use technology. Cultural forces and personal experiences created attitudes and anxieties about use of technology that were gender related. Finally, outside of these cultural or personal experiences, there were few gender differences in attitude towards technology. The researchers then applied this body of knowledge to a study with 760 faculty members at a state university. They examined several issues concerning gender and technology including frequency of technology use, type of technology preferred, and importance of technology to learning. Males were reported to believe themselves to be knowledgeable, confident about using technology, experienced with technology, and innovators of technological use at a higher rate than females. Both males and females saw technology as important to the classroom learning experience and were equally prepared to use new technologies. However, when the issue was learning new technologies, women were more likely to want incentives such as bonus pay or release time than were males. They also more frequently cited barriers to learning such as lack of time. These barriers could have serious implications

when designing a training program, as gender differences may create different needs in training.

Evans (2001) saw gender differences as being a plus for females. She thought that the Information Age was very different from the Industrial Age. The Information Age, according to Evans, would favor women due to its reliance on brain power rather than the muscle power required for the dominant jobs of the Industrial Age. Certainly, there was an argument that many Industrial Age jobs, particularly those in upper management, did not rely on muscle power. There is some point to be made that in a computerized, interconnected world, brain power would be a major asset. Evans also commented that because of cultural training, women were more comfortable with consensus management. They would, therefore, be valuable as links between the technology and the people, a role that could be of great value to education.

Women, African-Americans and Hispanics have all been reported as infrequent in the top ranks of technology faculty positions. One set of findings, reported by Gandy and Nelson (2004) indicated women were close to nonexistent in tenure and tenure-track positions in the science and engineering fields despite years of federal regulations designed to give women equal opportunities. This could have dramatic impact on the current generation of females who might complete their college years without encountering a single female academic role model. Again, this could have a serious impact on finding female faculty with technical expertise.

Another area of concern, similar to gender, is one of race and ethnicity. Institutions that are primarily African-American, especially those schools grouped in

what are known as the historical black colleges, have been widely reported to have had less access to technology. Foster (2003) reported on a federal grant, administered through the National Science Foundation, that attempted to help these institutions catch up by providing networking capabilities and allowed schools to purchase hardware and software. The Minority-Serving Institution Digital and Wireless Technology Opportunity Act of 2003 provided money for training at select institutions; however, past experience has been that these institutions have had problems attracting and keeping technical staff. Unless the infusion of money is large enough to significantly raise salaries, technology training programs at these institutions were anticipated to continue to lag. Another initiative, reported by Roach (1998), was developed by the Executive Leadership Foundation to help historically black colleges plan for innovation and included a section on training faculty as well as creating a technological infrastructure. Students graduating from such institutions may not have had as great an exposure to technology as others and certainly may not have had the exposure to instructors using technology in the classroom. If these students end up as faculty members, training may need to cover basic pedagogical implications for using technology in the classroom. Similar to gender, there seemed to be a correlation between race and the level of comfort or experience with technology.

Another area of concern dealt with the age gap. There has been a technological gap between those professors who graduated prior to 1985, the year when technology began making a major contribution to education, and those students who have been raised in an era where every house had a computer and people have always been able to chat or

instant message to anyone anywhere in the world. Harwood (2002) referred to this as the technology culture clash and discussed the implications of facing students who had always used a computer as a writing tool and, in fact, had developed their skills for writing through the use of a computer. In his interview with Barone of Educause, Harwood mentioned that educators may be missing something fundamental by not understanding the perspective of students who have been raised with technology. Barone commented that in some cases, students were going to help desks not to seek help with technology but to try to find ways of communicating with professors who were out of the technology loop. Barone also mentioned that some faculty members felt humiliated by their lack of computer knowledge especially compared with the knowledge held by their students. Barone did not believe that institutions had yet built the types of structures that would help faculty members over the technology gap and that faculty "need to take advantage of technologies that enable new kinds of interaction among faculty and students" (p. 23). The problem, according to Barone, was expected to worsen as a younger generation comes along, a generation who has always had technology, not only in the home but also in education.

Training for Technology

Argyris (1998) saw that attitude was one of the biggest obstacles in training or teaching anyone and that the very nature of the successful person created a barrier to change. The characteristics that made someone successful were often the same factors that made it difficult for the person to learn. Argyris stated, "many professionals are

almost always successful at what they do . . . they have never learned how to learn from failure" (p. 83). A professor, though well versed in his or her content area, may find it difficult to accept that the technology presents a learning challenge. If professionals have difficulty in learning, there is more likelihood that the introduction of technology into the workplace will be a major disruption? Argyris referred to this dilemma as confronting the fear by professionals that they were not doing their best, that their performance was less than excellent. In order to walk into a classroom and teach, professors must have confidence in their own knowledge. Technology, however, poses a threat to some, especially those uncomfortable with technology, who are facing a classroom of computer savvy students. Overcoming that fear was a challenge that Argyris claimed daunted even the most capable manager. But overcoming that fear and admitting that additional training and knowledge was needed to remain competent has been exactly the challenge posed in technology training. Dusdick and Sonner (2000), in discussing computer users and training, said there was little regard as to whether or not the user was already computer proficient, was not using computers but wasinterested in computers, or was computer phobic. Clearly these three categories have an impact on the user's attitude towards technology.

Similarly, Bell (2004) saw faculty resistance to learning new technologies, particularly library technologies, to be a case where the technology appeared too difficult and confusing. Bell suggested that faculty would only learn new library technologies if they could do so in 30 minutes or less, had no more than one page of reading material and

carried no cost whatsoever. This is the same attitude about which many educators have complained in their students.

In a study of 117 members of a community college faculty, Dusdick and Yildirim (2000) found that a significant predictor of classroom computer use was training and a feeling of competency. Those faculty members who had the highest level of competency were most likely to use computers in the classroom. Furthermore, the study also revealed that ownership of a home computer strongly correlated with level of competency. Training was another important factor for classroom usage. Not surprisingly, instructors preferred to learn about computers in different ways based in part on their attitude towards computers and their current level of competence. The study indicated that the more competence the users had, the more likely they were to want very specific training on specific hardware. Conversely, the less competent users wanted shorter sessions, personal attention and help resources. This latter group also needed to have the benefits of the technology explained, and they were more reluctant to use the technology.

In another study of 101 full-time university business school faculty members conducted by McKinnon, Smith and Smith (1985), only 35% of the faculty felt they were knowledgeable about selecting between different brands of computers. The university purchased IBM personal computers for the faculty. The faculty were surveyed before the arrival of the computers and 10 months after the arrival of the computers. The study reported that over 94% of the faculty felt strongly or very strongly that computer usage was important to their profession. The part of the survey conducted prior to the computer arrival indicated that 66% planned on using their computers on a daily basis. The second

survey showed that faculty were exceeding their expectations about use. They were using the computer more than they had thought they would.

A study by Mitra, Steffensmeir, Lenzmeir and Massoni (1999) was focused on computer use by faculty and their changing attitudes towards computers over time. The researchers found that there had been a profound shift in the way that faculty used computers during the course of the longitudinal study. The usage had moved away from a tool for computing and data processing to a communications tool and a means for preparing and delivering presentations. The traditional use of computers for such tasks as database management and statistical analysis had not increased over time, but the use of computers as a communication device dramatically increased. The authors suggested that this implied that sophisticated users continued to use computers as they had in the past. Relatively new users, however, first explored those areas of technology related to communications. Allowing new users to explore and learn those areas of technology most important to them as new users was an important concept in building a good training program.

Designing a system for faculty development has been a difficult task. Quick and Davies (1999) surveyed and interviewed community college faculty members about technical training and suggested five criteria for training projects but warned that no amount of planning will help faculty learn if they were not given adequate time to do so. The first consideration was literacy. Quick and Davies asserted that information literacy was the cornerstone for all technology. Knowing how and where to find information on technology provided support for faculty attempting to learn more about technology. The

next idea dealt with lecturing. Many of the participants in the survey wanted to use technology to support lecture rather than use technology to create new methods of learning. Quick and Davies recommended further research to discover why instructors would reject methods that might help student learning so that they could continue with their preferred strategies. Next, the researchers stressed that time was an important consideration is planning change. The reasons why faculty wanted to learn technology needed to be understood in order to build an effective program. Quick and Davies asserted that many faculty members were interested in technology but wanted to make sure that it was easy to set up and use, controllable and fully supported with help staff. Finally, participants wanted training that fit their schedules and was conveniently located. Quick and Davies recommended that administrators turn over the design and planning of such training to the faculty with appropriate follow-up and technical support.

Professional development as defined by Seyfarth (2002), exists to create or cause change. Seyfarth addressed teachers' needs for specific guidelines on how new technology worked and indicated the importance of having the opportunity to use technology and be supported in a non-judgmental environment. Instructors were not always convinced that new technology was better technology and wanted to be convinced before they used it. Seyfarth suggested that the need for congruence between the technology offered and the teaching philosophy. Seyfarth suggested that coaching may be the most effective way to teach teachers by using peers to help learn new techniques and that there had to be congruence between the technology offered and the teaching philosophy.

Seyfarth (2002) outlined several steps for creating an effective professional development program. Although his work was designed for the K-12 educational system, it has validity for the higher education system as well. The first steps involved having clear objectives and creating content that matched those objectives. He also mentioned that it was important for teachers to have a chance to work with the technology to see that it had value for their classrooms and that the training emphasized the practical over the theoretical. In terms of the practicalities of such training, Seyfarth recommended that workshops present theory, demonstrate the teaching, give practice time and provide opportunities for feedback. The duration of the session, whether the material was presented in one single session or over the course of several sessions, was based on the complexity of the learning task. Seyfarth also mentioned that the context of the learning was important, i.e., comfortable facility, appropriate aids, but did not discuss the use of incentives in the form of a stipend or other rewards to create interest. He did, however, mention that follow-up in the form of on-going support was essential.

In creating development programs, Picciano (1998) recommended four common elements in training programs. Even though he was dealing primarily with teachers and staff in the K-12 system, the elements are valid for training teachers in any area. Picciano listed hands-on activities as a primary method of instruction. He believed proficiency could only be achieved with practice. He also recommended one on one coaching, in short one or two hour sessions, as the most effective method of training. As far as who should act as the coach, Picciano suggested that outside experts be allowed to train a group of internal experts who would then train the remaining individuals. Picciano

considered this method as the most cost effective and as the method that would guarantee an on-going system of training. Finally, Picciano stated that administrators must be prepared to obtain equipment provided exclusively for teacher's use.

Starrett and Rodgers (2003) suggested that one of the best resources for faculty training was other faculty, especially those faculty members known to be early adopters. These professors were generally the first ones to use any new technology and were quick to find uses for such technology in their teaching. The authors viewed such faculty members as an already existing resource who had credibility with the institution and were enthusiastic about the technology. As such, these early adopters were a perfect resource for an institution to use in training other faculty members.

Similarly, Smallen (2004) posited that despite an institution's best efforts, training often was underutilized and inconsistently attended. He stated that the major constraints were the amount of time available for training, the availability of the audience, and the variety of technologies to be learned. He suggested a different approach to training that involved small groups working together to learn the technology, an approach he called the "study group." Another technique was "supported work times" where trained staff members would have regularly scheduled times where they would be available to anyone who needed to stop by and ask questions.

Another case study, presented by Byers, Byers, Hoadley and Pike (2000), examined the University of South Dakota which built a facility specifically for the training of faculty. The university brought guest speakers from a wide range of disciplines to campus. These experts were invited to share information related to their use

of technology in their fields. This approach had the advantage of allowing faculty to connect to someone in their own academic area and to comprehend how widely used technology is in education. The university developed a 130-hour training program with the objective of getting faculty members to utilize technology on a daily basis. Faculty were given a 50% release in order to complete the program and each academic unit was given the opportunity to select two faculty members per term for training. The faculty members were expected to select a course that they were normally teaching and modify that course to include more technology. Faculty were given pre- and post-tests to see how their attitudes towards technology changed during the training. Overwhelmingly, the faculty reported that technology was relevant to their professional activities; however, the faculty also reported increased stress from computer use. The results may have been skewed by the fact that professors volunteered to be selected by their departments for this professional development, so it is conceivable that only those who already had a positive attitude towards computers entered the program. The university has continued the program on a somewhat redesigned basis due to budget considerations.

Leadership in Technology

Leadership has been an important consideration in the response of higher education institutions to the challenges of technology. Rossett and Mohr (2004) discussed how leadership could create enriched technology use. The authors referred to their ideas as performance support tools that were an asset to help people accomplish tasks.

Floyd (2003) described the transforming power of technology. Technology had opened doors for students by creating more, diverse learning opportunities. There was, however, a test of the system because the faculty was expected to change, something that was difficult and scary for many in education. According to Floyd, the institutions which could successfully adapt to new technologies were those which could create a leadership plan to help faculty, administrators and staff utilize technology in an innovative and effective way.

West (1996) determined that technology had changed leadership in a significant way over the last decade. Previously, one of the roles of the leader was to select technology that fit the culture of the institution, but technology was forcing changes in the culture. The role of the leader was to guide the culture through the change. West further asserted that most institutions would need a Chief Information Officer (CIO) to serve as an advocate for technology and help the institution manage the complex and often conflicting information about changes in technology.

One interesting case study on the importance of leadership in the implementation of new technology was conducted by Romm (1999). The subject of the study was the diffusion of an e-mail system at a university; and in this case, leadership provided an important element in the diffusion. The president of the institution created e-mail accounts to help the executive assistant communicate with the provost's office. The assistant was so happy with the results that she shared the information with other administrative assistants, many of whom adopted the system and then persuaded their bosses to adopt the system as well. Within 90 days, there were over 100 users. The next

step was to hold an informational event; many academic members attended. The new e-mail system was demonstrated, and faculty and staff were urged to experiment with it. No one was forced to accept the new system. Departments that had early adopters in them were given the opportunity to hold training sessions within the department. In less than a year, about 66% of the faculty and staff were using the system. Not all of the outcomes of the new system were positive. A group of dissident professors used the new system to organize a vote of no confidence in the president. The president survived the political strain and the university had a functioning e-mail system. This model of not forcing new technology, but allowing it to organically spread from user to user, has not been emulated in many other institutions.

Hanna (2003) also expressed the importance of leadership in higher education. Two of the strategies that he listed as necessary to survival for institutions were support for technology and building technologically competent faculty. The resistance to technology was, in part, due to an increased workload with few if any additional resources. Additionally, Hanna said that:

> In a world dependent on technology for its communications, its economy, and, increasingly, its day-to-day organization, higher education institutions that are serious about meeting the challenges of technology will invest in faculty members who are experienced with technology and who can both model this experience and pass it on to students (p. 28).

Most important of all, administrators must have a comprehensive technological plan in place. Certainly any program must have defined outcomes prior to its inception to succeed. Administrators need to think about what they want the faculty to do with the technology and what faculty would like the technology to do. Then, administrators need

to be prepared to pay for and support the effort. The problem of planning for technology has been what Green (2002) referred to as “tracking the digital puck,” relating technological innovation to a high-speed hockey match where the object of the game is moving rapidly and likely to change direction at any second.

Cost Factors in New Technologies

Cost has always been a factor in the planning and implementation of new technology. The funding has been and will remain an obstacle for many administrators. Green (2002), as Director of the Campus Computing Project, has been tracking technology on college campuses for well over a decade. In his 2002 report, he found that spending on technology, for both the academic unit and the administrative unit, had decreased in over half of the public institutions surveyed. The private institutions fared slightly better but not by much. Approximately one third of all public and private institutions reported a decrease in funding. The decline was seen in all four key technological areas: academic purchases, administrative purchases, institutional purchases and server/network purchases. At the same time, over one-third of the schools reported plans for new wireless infrastructure, and about one-fifth reported planning a new campus computer portal. It was not apparent how the schools planned to cut spending and increase technology at the same time. By the time of the 2003 report (Green, 2003), over three-fourths of the institutions reported plans for wireless networks. Once more, one-fifth of the institutions reported that a portal was being developed. Again, there was a drop in funding for both public and private colleges; this time, two-

fifths of the institutions, private and public, reported a drop in academic and administrative spending for technology.

Olsen (2002) reported on two solutions to the funding problem used by different institutions. Wichita State University installed an Internet2 connection, a type of high bandwidth network, designed to aid researchers at major research institutions. Such connections may run as high as $10 million to install and a continuing fee of $150,000 to $300,000 per year to maintain, a substantial investment for a school. In order to fully utilize this investment, Wichita State University hired a staff to help professors conduct high-speed research and a trainer to facilitate use, One professor at the University called this “the most critical resource.” The university also provided small grants of $5,000 as an incentive to professors who might not have thought of using Internet2 for projects. Within six months, the school went from no users to 100 users. Conversely, the University of Georgia also installed Internet2 but did not create any incentive and had only two users. Subsequently, they held an event to spread awareness of the high-speed connection and have gone to the faculty to try to find users. Again, educating faculty on the possibilities of the technology and inviting them to share in the technology without forcing them into interfacing with technology provided a positive outcome for the institution.

Most challenging of all of the budget problems is moving toward a budget planning process that replaces what Smallen and McCredie (2003) referred to as budget dust. In their viewpoint, too many institutions fund technological innovations from the remains of the budget at the end of the fiscal year. Institutions have often used this

windfall to obtain technology that has not been funded during the rest of the fiscal year. In order to be able to create a comprehensive technology plan and budget, Smallen and McCredie suggested several design principles. The first, similar to West's (1996) suggestion, was to assimilate technology into the institution's culture. By doing so, the needs and goals of technology would be aligned with the institution's missions, goals and objectives. Additionally, institutions would be expected to find a way to use technology effectively and efficiently and to have a realistic picture of what technology was providing to the institution and what it was costing. Finally, institutions needed to build a budgeting process that was equitable and reasonable and that looked for funding sources outside of the institution as well as the traditional models of funding.

CHAPTER 3
METHODOLOGY

Introduction

This chapter provides an overview of the methodology and procedures used to conduct the present study. It provides a review of the purpose of the study and research questions. Detailed information is provided regarding the population, instrumentation, data collection, and data analysis procedures of the study.

Purpose of the Study

The purpose of this study was to examine to what extent Florida's community colleges have begun to prepare for the broadcast video format change mandated by the Federal Communications Commission that will occur in 2009. The study focused on three areas of preparation: planning, personnel and budgeting.

Research Questions

1. What steps have the Florida community colleges taken to prepare for the mandated change to digital television?
2. Who has been identified within the Florida community colleges to assume the responsibility of dealing with the issues associated with the conversion?
3. What factors about the conversion are of most concern to the Florida community colleges?
4. What specific plans, if any do the Florida community colleges have for implementing the conversion?

5. What plans, if any, do the Florida community colleges have for educating and training faculty and staff in the new technology?
6. What projections, if any, do the Florida community colleges have of the total cost of the conversion?
7. How do people within an institution perceive the transition?

Population & Sample

The population was comprised of a representative from each of Florida's 28 community colleges. The specific representative targeted was a chief technology officer; however, not all community colleges had such a position or used such a job title. In cases where a college did not have an officer bearing the title, chief technology officer, an attempt was made to discover the person responsible for technology for the college. This was discovered by reviewing the organizational charts of the college and identifying the person who was part of the executive level of the college's governance and who had staff reporting to him or her who were engaged in the technology services of the college. The names and addresses of the targeted population were gathered from the public records of each institution, primarily from the websites for the colleges. The survey was sent to this targeted person. However, in some cases, the individual addressed passed the survey on to another person at the institution. All surveys returned were included in the study regardless of respondents' job titles.

Instrumentation

A 19-item survey instrument, High Definition Television (HDTV) and the Community College Questionnaire, was created by the researcher. The 19 items addressed the preparedness of institutions for the mandated change to digital television in regard to personnel, planning and budgeting. Data obtained from the survey were used in the quantitative phase of the data analyses.

The initial version was disseminated during the 2004 League of Innovation conference. Participants at a roundtable discussion on HDTV were asked to complete the survey and provide feedback on the design of the survey. A total of 15 participants completed the survey and answered questions about its design. That information was used to create the final survey instrument. No other tests for reliability or validity were performed, and no claims for the reliability or validity of the survey instrument can be made. The survey instrument and interview questions, along with the support materials such as contact letters and consent forms, were submitted to and approved by the Institutional Research Board at the University of Central Florida (Appendix A).

The final instrument (Appendix B) was colored printed on 17 x 11 white paper and folded to create a four-page booklet. The design contained several elements used to clarify the instrument. Alternating green bars were used to highlight each question. This was done to make each question more readable and used to resemble the green-bar paper commonly used in technology.

Surveys were coded with a randomly assigned stamped design at the bottom of the survey. The researcher used four color inks and eight stamp designs to code the

surveys. Each survey had at the bottom of the last page a handwritten notation of “thank you!” and a unique combination of stamp design and color ink. A master list of all of the combinations and the institution names was maintained to allow follow-up contact to be made for non-responsive institutions. This list was destroyed at the conclusion of the research.

Data Collection

The survey was sent by United States mail delivery and was a part of a five contact package designed under the principle’s of Dillman’s (2000) tailored design method. A prenotice letter was sent a week prior to the mailing of the survey to alert individuals that the survey was coming. The survey was sent in a large, flat envelope and was accompanied by a stamped, return addressed envelope and a token gift in the form of a $5 gift card for a national chain of coffee shops, following Dillman’s social exchange theory that including a small gift would potentially increase the number of responses. Also included with the survey form was a letter with the contact information for the researcher and a consent information sheet that participants were asked to keep so they would have a record of the contact information for the researcher.

A thank-you postcard was sent one week after the survey to remind participants to return the survey. As surveys were returned, the institution was checked off the master list using the coded colored stamp at the bottom of the survey. Institutions not initially responding were sent a letter emphasizing the importance of the research and urging participants to respond. This packet was sent four weeks after the initial survey mailing.

Institutions still not responding received a final mailing about two weeks later containing a second survey that had the same coded colored stamp originally used for each institution, a stamped, return addressed envelope, and a letter asking them to return the survey when completed. Participants were assured this would be the final contact and were asked to respond by mailing back the survey even if it was blank. A total of 17 surveys were returned for a final return rate of 60.7%. All materials used in these mailing are found in Appendix B.

Item 19 of the survey asked responders to provide their names and contact information if they would be willing to participate in an interview. Those survey respondents who answered affirmatively were contacted either by e-mail or by telephone to arrange an interview appointment and were asked to provide the names of those within that institution that might be willing to be interviewed. At each of the institutions targeted for follow-up interviews, individuals were sought to participate in the interview process. The names of additional interviewees were gathered from the websites for each college. These individuals were then contacted via telephone or email and asked to participate. The chief technology officer or the survey responder was one category of individual selected. Another category was a budget officer or someone within the financial office of the institution responsible for budgeting for technology. The third category of individual sought for the interviews was an end user of technology. An example of an individual in this category was someone whose daily functions involved video or television technology such as a librarian, media specialist, audio-visual specialist or an instructional support staff person. Other possible interviewees were a department head of an academic

program such as digital media or television production, or the director of any campus broadcast facility. The division of interviewees into one of these categories was vetted by two outside evaluators. One of these evaluators was a faculty member at a community college; the other evaluator was a member of the professional staff at a community college. Both evaluators were given the category definitions presented above and the job titles of the interviewees. The evaluators placed the interviewees into categories that matched those established by the interviewer. These categories then were used to ensure that each interview was conducted using the appropriate set of interview questions.

Three lists of interview questions were prepared. Each participant was asked questions from a single list depending on that participant's classification as a chief technology officer, budget officer or end user. The questions were developed to begin with a series of simple yes or no response questions to provide some background and help establish rapport between the interviewer and the subject. The questions then generally dealt with process within the colleges and concluded with questions specifically about HDTV. Copies of all interview questions are contained in Appendix C. The interviewer did depart from the question list in order to clarify or follow up on comments made by the interviewees.

A total of five institutions and eight interviewees agreed to participate in the interview phase of the study. Interviews were either conducted face-to-face or over the telephone depending on the distance involved and the preference of the interviewee. Interviews were conducted starting in May 2006 and were completed by June 2006. One interviewee requested the questions in writing and then responded in writing. Interviews

were conducted individually with one exception and were tape-recorded with the participants' permission. The exception was one institution with three participants who requested to meet as a group with the interviewer. The written notes and tapes from these interviews were coded to ensure confidentiality, and the tapes were transcribed into written form and then destroyed. The coding of the interviews was completed using a chronological series of numerals. For example, the first end user interviewed was assigned the code, "end user 1," the next was "end user 2." This method was used in all categories. Signed consent forms for each interview were gathered. Interviews were completed in time periods ranging between 15 and 60 minutes.

Data Analysis

Once the surveys were returned, responses from the surveys were entered into a database using SPSS software for analysis, and descriptive statistics were obtained. Data were processed using a mixed methods approach of quantitative information from surveys and qualitative information from the follow-up interviews. After the data was entered into the database, the original surveys were destroyed.

The tapes of the interviews were transcribed by a professional transcription company and the quotes for the report were selected by the researcher for inclusion in this report.

Summary

The research was an emergent design using a case study approach. A survey was mailed to the 28 Florida community colleges and addressed to the chief technology officer or a similar representative. The survey addressed the issues of planning and budgeting for the change to digital television and sought to ascertain the level of awareness of the issue. Respondents were asked if their institution was planning a conversion and to evaluate the factors of cost, implementation and training in regard to their relative importance to the institution's plans and to identify those people and groups both from within the institution as well as from outside of the institution who were involved in the conversion plan. Interviews were conducted with people at five of the responding institutions in order to expand the answers from the surveys and to compare and contrast responses from individuals at different job levels within the institutions. The data gathered from the surveys along with the material gathered during the interviews was used to produce a picture of the knowledge of HDTV within Florida's community colleges. The resulting analyses of the data are presented in Chapter 4.

CHAPTER 4
ANALYSIS OF DATA

Introduction

This chapter has been organized to present the quantitative and qualitative data gathered for the study. The results obtained for each of the 19 questions in the survey are presented in the first section to provide initial quantitative data received from respondents. Narrative descriptive statements have been used to present the results for each item. Tables and figures have been added for selected items in order to provide further clarity in the reporting process.

The second section has been organized by the seven research questions which guided the study. It is in this section that the results of follow-up interviews are reported. These interviews were scheduled with willing participants from several institutions. The interview subjects were asked to respond to a list of questions which had been specifically developed for each job category of interviewee. The lists of questions for each job category are located in Appendix C. Selected quotes from the interviews have been included in the report in order to convey attitudes and information about the perceptions of respondents regarding impact of HDTV at their institutions. Both the quantitative data obtained from the surveys and qualitative data elicited in follow-up interviews were used in formulating a response for each of the seven research questions.

Analysis of Data Obtained Through Survey

For the quantitative phase of this research, the 19-item survey, High Definition Television (HDTV) and the Community College, was mailed to representatives at the 28 community colleges in Florida. Data obtained from those surveys were entered into SPSS to extract descriptive data. Primarily, the data were examined for frequency of responses. The responses to the 19-items by community college representatives are presented in order to provide descriptive data important to the study.

Item 1: What answer best describes your institution's broadcast facility?

Of the 17 respondents, 2 respondents did not respond to item 1. Of the remaining 15 respondents, 7 (47%) reported that their institution did not have any broadcasting facility, 1 (6%) reported that the institution used broadcast facilities loaned or leased from a local station, and 7 (47%) reported that their institution had its own facility. Figure 2 illustrates the distribution by percentage of these responses.

Figure 2. Item 1: What answer best describes your institution's broadcast facility?

Item 2. Does your institution own broadcast equipment?

Of the 17 respondents, 10 (59%) answered affirmatively and 7 (41%) answered negatively.

Item 3. Does your institution use broadcast television to deliver classes?

Of the 17 respondents, 1 respondent did not answer. Of the remaining 16 respondents, 9 (56%) answered affirmatively, and 7 (44%) answered negatively.

Item 4. How knowledgeable would you describe yourself on HDTV?

Of the 17 respondents, 1 (6%) answered "very knowledgeable," 7 (41%) answered "knowledgeable," 6 (35%) answered "somewhat knowledgeable," and 3 (18%)

answered “not knowledgeable.” Figure 3 graphically illustrates the responses to the question of level of knowledge of HDTV.

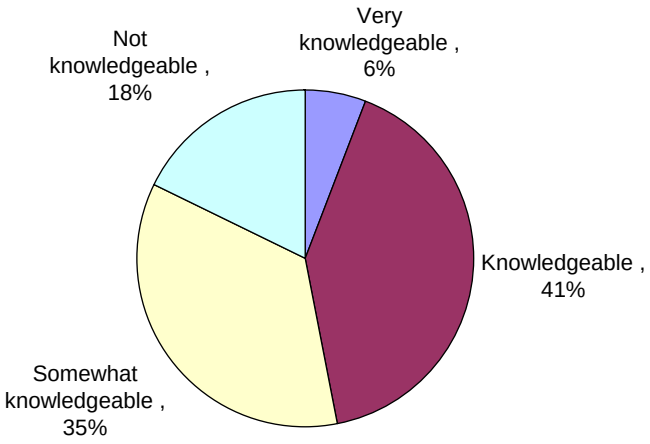

Figure 3. Item 4: How knowledgeable would you describe yourself on HDTV?

Item 5. To your knowledge, is your institution planning to convert to HDTV? Of the 17 respondents, 5 (29%) answered affirmatively, and 12 (71%) answered negatively. Respondents who answered “no” were instructed to skip to item 15 on the survey.

A total of 11 respondents skipped items 6-11. A total of 10 respondents skipped items 12-14.

Item 6. How complete are your institution’s plans for HDTV conversion?

Of 17 respondents, 11 respondents did not answer. Of the remaining 6 respondents, 1 (17%) answered, “very complete,” 2 (33%) answered “neither complete

nor incomplete," and 3 (50%) answered "very incomplete." No respondents selected "somewhat complete" or "somewhat incomplete."

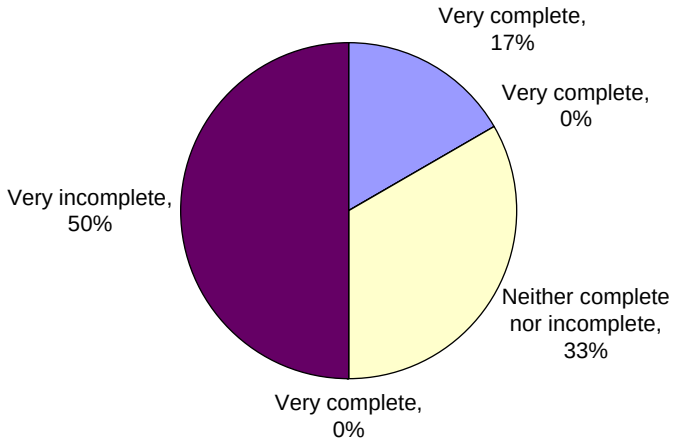

Figure 4. Item 6: How complete are your institution's plans for HDTV conversion?

Item 7. How do your institution's plans for HDTV conversion compare to other Florida community colleges? Of 17 respondents, 11 respondents did not answer the question. Of the remaining 6 respondents, 1 (17%) answered "more advanced than others," 3 (50%) answered "as advanced as others," and 2 (33%) answered, "no opinion." No respondents selected, "much more advanced than others," "less advanced than others," or "much less advanced than others."

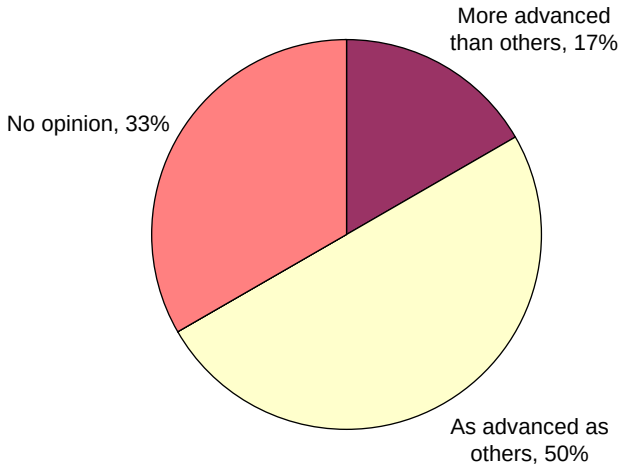

Figure 5. Item 7: How do your institution's plans for HDTV conversion compare to other Florida community colleges?

Item 8. How quickly will your institution convert to HDTV? Out of 17 respondents, 11 respondents chose not to answer. Of the remaining 6 respondents, 1 (17%) answered, "very rapidly, plan to be among the first," 1 (17%) answered, "somewhat rapidly, ahead of many institutions," 3 (50%) answered "about the same as the others," and 1 (17%) answered, "later conversion than the rest." No respondents selected, "holding back, plan to see how other institutions convert." Figure 6 graphically displays the responses to item 8 which concerned the extent to which the institution had formulated an implemention plan for conversion.

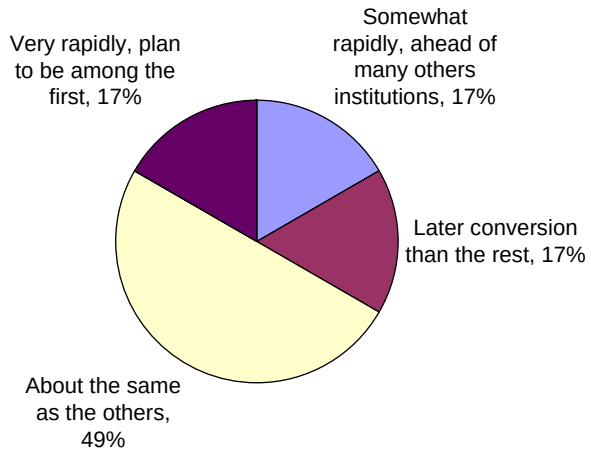

Figure 6. Item 8: How quickly will your institution convert to HDTV?

Item 9. Has your institution formulated an implementation plan for conversion? Of the 17 respondents, 11 respondents did not answer this item. Of the remaining 6 respondents, 3 (50%) answered affirmatively, and 3 (50%) answered negatively.

Item 10. Has your institution prepared a budget of projected cost for conversion? Of the 17 respondents, 11 respondents did not provide an answer to this item. Of the remaining 6 respondents, 3 (50%) answered affirmatively, and 3 (50%) answered negatively.

Item 11. Has your institution prepared a training plan for faculty and staff?

Of the 17 respondents, 11 respondents elected not to answer. Of the remaining 6 respondents, 1 (17%) answered affirmatively, and 5 (83%) answered negatively.

Item 12. Identify those who most likely will be included in creating a plan for conversion. Of the 17 respondents, 7 respondents answered this item. Multiple responses were possible. Of the selected answers, faculty was selected 3 times; administration was selected 5 times; technical staff (IT) was selected 7 times; Non-technical staff was selected 2 times; outside consultants were selected 4 times; industry/business partners were selected 4 times, and other was selected only once. In the case of "other," no specific entity was mentioned. Table 1 shows the distribution of employees within the institution who were named as likely to be included in a plan for conversion.

Table 1
Item 12: Conversion Involvement by Position (N=26)

	Responses Per Institution								
Position	1	2	3	4	5	6	7	N	%
Faculty	x			x		x		3	11.5
Administration	x	x	x	x	x			5	19.2
Technical staff (IT)	x	x	x	x	x	x	x	7	26.9
Non-technical staff				x	x			2	7.6
Outside consultants		x	x	x	x			4	15.4
Industry/Business partners	x		x	x	x			4	15.4
Other		x						1	3.8

Note. Multiple responses were possible from the 17 respondents.

Item 13. Has anyone at your institution been assigned the responsibility for the conversion?

Of the 17 respondents, 10 respondents did not answer. Of the remaining 7 respondents, 4 (57%) answered affirmatively, and 3 (43%) answered negatively.

Item 14. What is that person's job title?

Of the 7 respondents answering “yes” to item 13, 5 responded to this question. The job titles listed were: director of engineering, director of libraries, director of learning innovations, station manager, and coordinator of media services.

Item 15. Which factor about the conversion concerns you the most?

Of the 17 respondents, 3 respondents did not respond to the question. Of the remaining 14 respondents, 13 (93%) answered, “cost,” and 1 (7%) answered “implementation.” No respondent selected “training.”

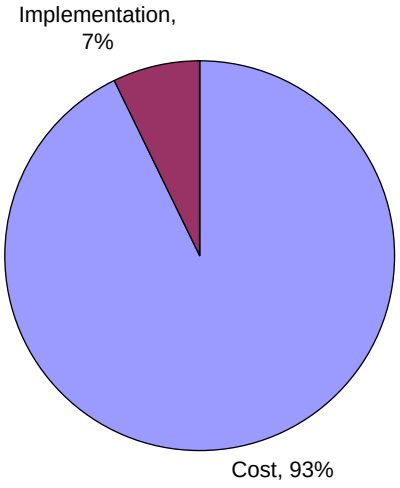

Figure 7. Item 15: Which factor about the conversion concerns you the most?

Item 16. Which factor about the conversion concerns you the second most? Of the17 respondents, 1 respondent did not answer the question. Of the remaining 16 respondents, 1 (6%) answered, “cost,” 11 (69%) answered “implementation,” and 4 (25%) answered “training.”

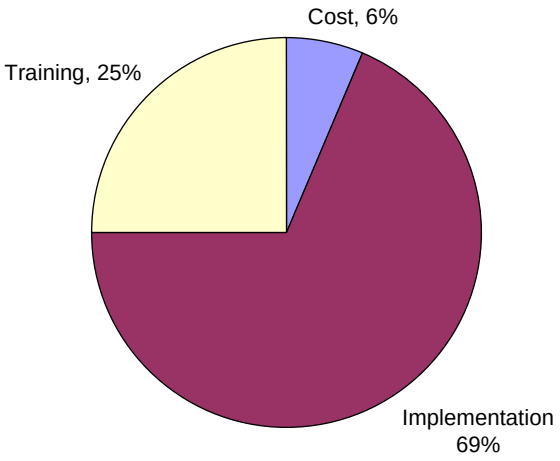

Figure 8. Item 16: Which factor about the conversion concerns you the second most?

Item 17. Which factor about the conversion concerns you the least?

Of the 17 respondents, 1 respondent did not answer the question. Of the remaining 16 respondents, 2 (13%) answered, “cost,” 4 (25%) answered “implementation,” and 10 (67%) answered “training.”

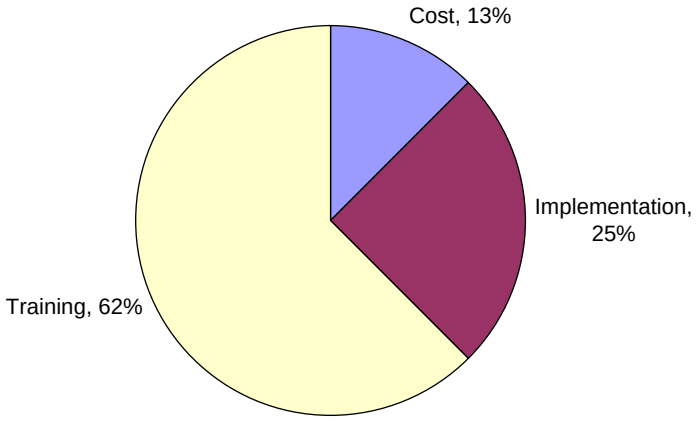

Figure 9. Item 17. Which factor about the conversion concerns you the least?

Item 18: What is your job title?

Of 17 respondents, 2 respondents elected not to share their job titles. Of the remaining 15 respondents, 6 (40%) answered “chief information officer,” 2 (13%) answered, “vice president of information technology,” 1 (6%) answered “vice president of administrative services,” 1 (6%) answered “associate vice president of information systems,” 1 (6%) answered “district vice president of technology services,” 1 (6%) answered, “director of management information services,” 1 (6%) answered, “manager of tv/distance learning,” 1 (6%) answered, “videographer,” and 1 (6%) answered “web designer.”

Table 2
Respondents by Job Title (N=15)

Job Title	N	%
Chief Information Officer	6	40.0
Vice President of Information Technology	2	13.3
Vice President of Administrative Services	1	6.7
Associate Vice President of Information Systems	1	6.7
District Vice President of Technology Services	1	6.7
Director of Management Information Services,"	1	6.7
Manager of tv/distance learning	1	6.7
Videographer	1	6.7
Web Designer	1	6.7

Item 19. If you are willing to be interviewed on this subject please list your name, phone number and email address.

Of 17 respondents, 8 (47%) provided contact information indicating their initial willingness to be interviewed.

Additionally, respondents were afforded the opportunity to provide additional comments or reflections after completing the survey. Comments about HDTV were written on 3 surveys. One comment indicated that the college was moving away from using television. Another respondent commented that the college was in a rural area where little to no HDTV was available. The third respondent providing a comment noted that the college's biggest concern was upgrading video cameras.

Qualitative Analyses by Research Questions

The interviews involved eight subjects at five different institutions scattered across Florida. The interviewees included two administrators, two budget officers and four end users. The end users were two staff videographers, a librarian, and a technical

staff member. Interviewees were given a chance to answer a series of questions and the opportunity to make any statements on HDTV that they felt were appropriate. Comments from the interviews were selected by the researcher to best reflect the overall themes of the interviews.

Research Question 1

What steps have Florida community colleges taken to prepare for the mandated change to digital television?

As the time for conversion draws closer, it was anticipated that colleges would have made some plans for conversion; however, no individual in either the survey or the interviews expressed any definite plans for conversion. There were some responses that indicated scattered pockets of conversion, but these were focused on departmental levels rather than institution-wide changes.

Research Question 2

Who has been identified within the Florida community colleges to assume the responsibility of dealing with the issues associated with the conversion?

As to who within the institutions had been given the responsibility for guiding the school through any changes, the responses were varied. No clear pattern emerged as to a department or area that would take charge. The closest any institution came to having a single person who assumed such responsibility was revealed in an interview response from Chief Technology Officer 1 who stated:

> We actually have a person whose title is coordinator of instructional technology, and they are tasked with identifying technologies that are being developed that

may have a direct impact in the instructional setting and then creating learning opportunities to maximize the use of those new technologies.

Research Question 3

What factors about the conversion are of most concern to the Florida community colleges?

In regard to what factor(s) were of most concern to the institutions regarding the conversion, not surprisingly, most institutions reported money as the primary concern. Of the survey respondents, 93% listed this as the issue of most concern. Chief Technology Officer 1 summarized the situation by saying:

> Money….and just simply said, we have a fairly significant investment in existing equipment, most of which will become obsolete depending upon, you know as you said, gee is it going to be obsolete in 2007, is it going to be obsolete in 2009?

Another comment made during the interviews was in regard to the impact of HDTV on the relationships between some television stations and the community colleges. While the television stations were clearly under federal mandate to make the conversion, colleges were not under any such mandate if they were not broadcasting. Chief Technology Officer 2 saw this as a problem because:

> To implement it, and you know…there is a….. I am not going to say a risk reward scenario, but probably a cost benefit analysis that will face any public television station that is connected to an institution of higher education that has to take a look at that technology to determine whether it is apropos to their institution.

Another concern was expressed by Budget Officer 1 who believed that HDTV was creating an entirely new process. He stated:

> I would say looking at it from an operational standpoint from the television station side alone is . . . absolutely vital because not only have you changed all the equipment, you've now changed the mindset from an operational standpoint to

> where you can't think about it like you used to. You have to rethink the entire process. As you're familiar with film and things like that and . . . and video as an analog format. It's no longer a tape that you're dealing with. You're now dealing with file management.

This concern for new processes and costs was reflected in the fact that of the institutions planning on conversion, technical staff and administrators were the two most frequently mentioned groups that would have involvement in the plan.

Research Question 4

What specific plans, if any, do the Florida community colleges have for implementing the conversion?

Despite some doubts about the technology and the cost of it, no institution reported creating a plan for conversion. Three institutions reported creating a budget but could not or did not produce any comprehensive budget. Most of the conversion plans seemed to have been developed for departments or areas and were not college-wide plans. The expressed opinions of the interviewees regarding HDTV were that the conversion would end up being postponed or delayed, and it would not benefit the institutions to make decisions too quickly about the technology. As related in the review of literature, this doubt has been expressed repeatedly with regard to the use of technology in education. Chief Technology Officer 1 said, "We do not like being leading edge on too many things, because simply that is a real expensive place to be, but we do not want to be too far behind the curve either." Another individual, End User 1, thought that his institution had a different view and said, "The college understands that we have

to be ahead of the curve and so we have several different ways of making sure that we are ahead of the curve."

Research Question 5

What plans, if any, do the Florida community colleges have for educating and training faculty and staff in the new technology?

In terms of the need for educating and training faculty and staff to implement a new technology, most institutions reported a confidence regarding their abilities to employ new technology. The responses were generally that HDTV training could take place within the already existing training structure of the institution. Chief Technology Officer 1 said:

> We have a professional development center on campus that is about 3,000 square feet which is for use only for employees for upgrading job skills or professional development activities and that includes a computer lab with the latest and greatest up to date equipment. We work real hard and spend a lot of money to keep it absolutely state of the art.

In the review of literature, the idea that some people are more reluctant to use new technology than others was found throughout the history of technology in education. Some of those interviewed were keenly aware that people within their schools might not openly embrace this change. Chief Technology Officer 2 summarized this viewpoint by saying:

> I understand that reluctance to step outside an instructional boundary that I've built for myself. I mean if somebody came to me in management and said oh you're teaching telecommunications you must use this content or you must use this delivery method. I'm going to stand back and say you don't know how I teach so I . . . I understand that.

Chief Technology Officer 1 expressed a similar view when he explained, "because new technologies for which we don't have a mechanism in place to teach faculty would be relatively worthless and technology that faculty aren't interested in would be absolutely worthless." Interestingly, when institutions were asked what group would be involved in planning for HDTV, only 3 of 11 institutional representatives reported including faculty in the decision-making process.

Just beyond the concern for appropriate training systems was the issue of finances. Training costs money even when in-house people are used to help train. In order to get insiders prepared to train, they themselves need training. All of this was associated with a budget, and the community colleges were concerned about that cost as well as the cost of the equipment. Budget Officer 1's comments accurately summarized the position of those interviewed.

> So the training monies we get are always subject to the bureaucratic knife. Whenever there's you know, a drop in enrollment or the state comes by with less money the first thing that's going to go is travel funds. We've been pretty good though that we've marshaled those very well. Again we have allocations and resources with regards to the funding for the television station that we get to play with a whole pot of money whether it's equipment, whether it's salary, whether it's training. It's . . . on the community college side it's . . . you have so much for training and you have to have a really good justification if you can make it to go grab money from another area and make it training money.

Research Question 6

What projections, if any, do the Florida community colleges have of the total cost of the conversion?

Despite the concerns of budget expressed in both the surveys and the interviews, no representative reported creating a comprehensive budget of associated costs or had

even begun the process of listing the equipment that would need to be replaced. There was some awareness that this would be a different type of cost than seen in technology in the past. Relating to Moore's Law, the rapid change in technology was creating an almost frenetic pace in the budget arena. Budget Officer 1 reported:

> The recent changes in the broadcast industry have also caused us to rethink our business model as well because in the past for analog technology we would buy a component that was good for 10 years um . . . just minimal maintenance as far as physical maintenance goes replacing parts and pieces, whereas now moving to the digital realm we are faced with issues that the station and the management of this station haven't been faced with before and that is software upgrades every three years, hardware upgrades every three years. You're making new expenditures on equipment that you've already purchased, where in the past you never had to do that. It is just a different mind set.

Research Question 7

How do people within an institution perceive the transition?

In answering the surveys and the interview questions, everyone contacted was aware of the coming change. But the perception of how soon that change would occur differed greatly, and how soon a particular institution might convert was varied. Chief Technology Officer 1 said, "Real preliminary at this point in time. I would say we will have a better feel for it sometime over the next 18 months or so as to when we will actually jump." End User 3 thought his institutions conversion was, "Somewhere between two and five years, you know a guesstimate." Finally, End User 1 summed it up by saying,

> Everybody knows it's there. Everybody knows it's the future, but now it's a matter of just getting the dollars and getting the momentum of the industry so that everybody slides into it at one time and you know, it will probably still take another five to ten years before everybody is HD.

Summary of Interviews

During the interviews, several themes emerged as important. One of these themes was cost; everyone interviewed mentioned the cost of HDTV and the difficulty of being able to afford new technology. Budget officers also were concerned about the cost of training. Administrators expressed a concern about the rapid obsolescence of expensive equipment and of conflicting needs within the community college. Similarly, end users were aware of changing standards and the shifting deadlines of the conversion and expressed concern over those issues.

Another theme to emerge was responsibility. This theme contained several elements. First was the process by which new technology was requested. All interviewees mentioned a bottom-up process in which the end users would be responsible for requesting equipment. Both the administrators and the budget officers expressed satisfaction at how the system worked. End users, however, spoke frequently of not getting equipment funded. End users also expressed a sense of responsibility for making sure that administrators were aware of new trends in technology. While everyone interviewed professed a knowledge of HDTV, not everyone had a grasp of all of the issues involving the technology.

Finally, training emerged as a prominent theme. Both administrators and budget officers thought that training could be handled within the confines of their own institutions. End users again had a different perspective as they saw outside training as necessary to stay current. Journals and other materials were also mentioned as a way to build knowledge. Table 3 displays a summary of the different opinions by job category.

Table 3
Emergent Interview Themes

Themes	Administrators	Budget Officers	End Users
Cost	Primary concern is cost; must be weighed against other needs	Cost and training important considerations	Cost is a major factor
		Requests come from end users	Also concerned about technical standards
Implementation Responsibility	Requests come from end users	Requests come from end users	Equipment requests not always funded
Training	Handled within existing college services	Handled within existing college services	Outside sources (conferences, workshops, etc.)

Chapter Summary

For community colleges in Florida, the perfect moment to convert to HDTV has not yet arrived. The major issue expressed through both the surveys and the interviews was cost. At the time of the survey (in late 2005) and of the interviews (in mid-2006), the community college representatives clearly had budget on their minds. Since that time, the state budget for community colleges has undergone severe cuts. In 2007, the state government told community college leaders to prepare for up to a 10% reduction in budgets at a time enrollment was growing (Community College, 2007). The effect of community college budget cuts on the implementation of a new technology was unknown. During the interviews, many participants hoped that the FCC's 2009 deadline

would be pushed back once again, giving them time to prepare for the implementation and the costs.

CHAPTER 5
CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

Introduction

This chapter contains a brief description of the purpose of the study as well as a summary and discussion of the findings. Also included in the chapter are implications of the study and recommendations for future research

Purpose of the Study

The purpose of this study was to examine to what extent Florida's community colleges had begun to prepare for the broadcast video format change mandated by the Federal Communications Commission that will occur in 2009. The study focused on three areas of preparation: planning, personnel and budgeting.

Summary and Discussion of Findings

The conversion to HDTV presented one of the best cases for planning for technological change. The lead time for the conversion was extensive by technology terms and information on the standards used in the technology was provided by the federal government. This change was not provoked by market whims or by rapidly advancing technology but rather by a well-studied decision of the federal government As the FCC continued to lengthen the deadlines and soften the criteria for HDTV, community colleges were one group of technology consumers who have been in a position to create a plan to move to HDTV in a careful, institutionally-appropriate way. Instead, the institutions had generally ignored the transition time and had not begun the

process of planning for the conversion. Following is a summary and discussion of findings developed for each of the seven research questions which guided this study. The earlier quantitative and qualitative analyses were used in finalizing the results of the study.

Research Question 1

What steps have the Florida community colleges taken to prepare for the mandated change to digital television?

Even as the deadline for moving to HDTV moved closer, most institutions had no clear plan to make the transformation. Even though three institutions reported having a plan, no comprehensive plan was ever demonstrated. In fact, 71% (12) of respondents reported that their institution was not planning to convert to HDTV. Whether this meant that they had no plan or whether they meant they had made a decision not to convert was unclear. One institutional representative reported partnering with local stations and so may be relying on the partner facility to make the needed improvements. For 47% (7) of the institutions, there was no broadcasting facility or joint use facility and for those institutions, the HDTV conversion may be perceived as having little-to-no consequence. But another 47% (7) of college representatives reported that the institution had broadcasting facilities of their own. Additionally, 59% (10) of the respondents reported that the institution owned some type of broadcast equipment, and 56% (9) of the respondents reported that the institution used broadcasting to deliver classes. These institutions did not report how they planned to continue broadcasting after conversion or if they planned to stop broadcasting. In one interview, the subject, a budget officer, said

the institution would most likely end broadcasting of classes and instead use an on-line video-on-demand system.

According to Rogers (2003), the time prior to a decision, the persuasion stage, was critical to decision-making, and so institutions should have been gathering information and assessing their needs for this technology. On the survey, 47% (8) of the respondents said they were either "very knowledgeable or knowledgeable" about HDTV; an additional 35% (6) reported that they were "somewhat knowledgeable". Given then, that 82% (14) of these institutional representatives had at the least some knowledge of HDTV, why they had not yet formulated a plan for conversion remains a mystery. Some institutions had departments making individual plans but not as part of a total campus plan for technology. Perhaps many institutions planned to wait and see how the technology conversion progressed. However, given the 2009 deadline created by the FCC, what these institutions were waiting for was unknown. At the time of this writing in the last weeks of 2007, the retail websites for two of the United States' largest electronic dealers, Best Buy and Circuit City, showed a total of four models of NTSC television sets for sale compared to hundreds of models of digital televisions. The window for purchasing NTSC equipment for institutional use was fast drawing shut.

Research Question 2

Who has been identified within the Florida community college to assume the responsibility of dealing with the issues associated with the conversion?

West (1996) stressed that technology changed an institution's culture and that leadership was important to guide the institution through that change. Similarly, Hanna

(2003) found that leadership was important in maintaining technological competence. However, the community colleges as a whole did not report having assigned people to the task of leading the implementation of HDTV. Of the institution representatives surveyed, 57% (4) reported having assigned a leader, but the remaining 43% (3) had not. This may have negative consequences for the colleges who have not selected a leader as HDTV becomes the standard throughout the country.

End users were the group most widely reported to be involved in the conversion as they were the experts on the technology. In the interviews, end users were more likely to express awareness of the FCC decisions. West (1996) suggested that institutions create a position of chief information officer (CIO) to help institution to gain knowledge of new technologies and to serve as technology advocate. Only one institution in this study reported having a person whose job description was similar to being a technology advocate for the college. Chief Technology Officer 1 reported:

> We actually have a person whose title is coordinator of instructional technology, and they are tasked with identifying technologies that are being developed that may have a direct impact in the instructional setting and then creating learning opportunities to maximize the use of those new technologies.

Not surprisingly, the institution where this person worked also reported being quite advanced in the conversion to HDTV. No other representatives reported having such a person involved in technology at their colleges. Additionally, looking at the job titles reported on the survey as being the institutionally selected HDTV conversion leaders, the level of expertise needed to make a smooth conversion may be lacking. It is difficult to judge any one person's technical competence based solely on job title, but some job titles (director of engineering and station manager) would imply competence in television

broadcasting standards. Other job titles listed (coordinator of media services, director of libraries, and director of learning innovations) seemed more remote and less connected to the skill set needed for leadership in such a technical area.

As shown in the literature, many people have developed a distrust of innovation in technology, especially since many of these technologies have proved expensive and inefficient. The e-learning experience has tainted many institutions on being early adopters of costly technologies. End users, who were often early adopters, may be viewed with suspicion by administrator because, as Zemsky and Massey (2004) noted, early adopters were enthusiastic about new technologies. As other new technologies emerged, early adopters moved on and if the technology had not been picked up by other users, it died within the institution, becoming a costly dead end. As a result, perhaps administrators have not listened fully to information provided for them by end users and have not realized the impact of conversion on an institution's budget. As Daniel (2001) noted, institutions often underestimated a new trend's longitudinal impact.

Research Question 3

What factors about the conversion are of most concern to the Florida community colleges?

For the vast majority of Florida's community colleges, the cost of moving to digital television and into HDTV far outweighed any other factor. On the survey, 93% (13) of the respondents said the cost issue was of greatest concern in regard to converting to HDTV. Implementation was generally reported to be the second most concerning issues with 69% (11) of the respondents listing it in this position. Finally, training was

listed as the least concerning issue with 67% (10) of the respondents listing this in third place among the three issues of concern.

Given the overwhelming concern about cost, it was surprising that institutions had not formulated any plan to pay for the conversion. In the interviews, there were mentions of the cost of conversion and the restraints of the state budgets. Throughout the literature, examples were cited of partnerships between institutions and community businesses to assist with conversion costs. However, no representative in any category from any institution mentioned any sort of partnership arrangement to help pay for the conversion. The only partnerships were those institutions involved with public access television who were relying on the television station for conversion.

Implementation, which can be thought of as the selection and installation phase of innovation, was not seen as an overwhelming concern. In interviews, many respondents expressed confidence in their ability to implement new technology once they felt that the technology was no longer in a trial stage. But as Rogers (2003) noted, this phase was fraught with problems. In reality, it is often the phase when the results of decision making were made apparent. Poor choices might not work properly within the system. As the literature showed, many innovations in the past did not live up to the hype that preceded them. However, in the case of HDTV, an institution can delay conversion only for so long. The federal government, through the FCC, has decided the video signal engineering standards and the implementation timeline for HDTV. Even if the institution does not use broadcasting in any way, it probably has television equipment within the audio visual

services department. As equipment breaks and needs to be replaced, the conversion to HDTV may become a costly spiral.

As for training, institutions may be correct in viewing this as a smallest part of the total problem of converting to HDTV. For most faculty and staff, using HDTV will be no different than using a NTSC set. Training technical staff for solving problems of signal flow and equipment compatibility and for converting analog media into digital form is an expensive type of instruction. Technical training of staff may require outside expertise.

One interviewee offered an opinion on an issue that did not appear in the survey. This was in regard to the legal implications of HDTV. If an institution owned an analog (most likely VHS) copy of material, did that institution have a legal right to digitize the material? This issue of copyright law may loom large in years to come as institutions try to deal with archival material that needs to be converted to digital formats.

Research Question 4

What specific plans, if any do the Florida community colleges have for implementing the conversion?

While 50% (3) of the respondents who answered the survey questions said that the institution had a plan, the representatives of the community colleges admitted that plans were not very advanced. Additionally, they thought that being in this situation was typical across the state for community colleges. Only 17% (1) of the respondents said that the institution's plans were very complete. A total of 50% (3) of the respondents answered that plans were very incomplete. Thus, there seemed to be at least the recognition that there were plans that should have but had not been made.

In comparing the institution with other institutions, 50% (3) of the respondents thought that their institution was about as advanced in their plans for implementing HDTV as other colleges, and the same number thought that their institution would convert at about the same time as others. It would seem that being in the "middle of the pack" was a comfortable place.

The expressed vagueness in plans resembled Starrett and Rodgers' (2003) description of a disastrous time in the 1990s when institutions bought technology without thought to how it would be used by the faculty and staff and how it would work in relationship to other technologies. In the survey, respondents were asked to list people who would be involved with making the plans for conversion. Within the institution, faculty and non-technical staff were the least mentioned groups. Given the importance throughout the literature on the importance of the attitude of faculty and staff on acceptance of new technology, this trend seems puzzling.

Not having a plan for technology can be a costly mistake. Smallen (2003) looked at the cost of "smart" classrooms. Having a classroom designated as smart generally means that there is some sort of television in the classroom used to support instruction. If colleges are investing in technology for these classrooms, the question arises as to whether HDTV sets are being purchased or NTSC sets will be replaced in two years? Changing a classroom television set to HDTV means that any device with signal flow into the set such as a video player needs to be HDTV compatible. Furthermore, if the television set signal flows to a larger monitor such a ceiling hung projector, that projector will also need to be capable of handling the HDTV signal. Thus, not just one piece of

equipment, but two or more, may need replacing. One interviewee who was involved in purchasing audio visual equipment for his institution was asked about this chain reaction of innovation and responded that the institution had not planned for HDTV in smart classrooms or in audio visual services. Most colleges had not yet thought about the implication of converting classroom equipment of HDTV. Responses indicated that while institutions may believe that they have a plan for conversion, most may not have an actual idea of what such a plan should include.

Research Question 5

What plans, if any, do the Florida community colleges have for educating and training faculty and staff in the new technology?

Community colleges had mixed estimations of their ability to train people in the new technology. Not one institution mentioned training as the primary issue of concern involving HDTV. Interestingly, 83% (5) of the respondents surveyed admitted that the institution had no training plan prepared; however, 67% (10) of the respondents listed training as the least concerning issue involved with HDTV. Generally, institutions had no training plan and no concerns about training.

Certainly for many users of HDTV, the new technology involves little or no training. For example, a professor who might order a television for a classroom in order to show a documentary would not likely need any training beyond how to turn on the power. But, even that simple task is not always easy for those who are not technologically proficient, and professors generally do not enjoy looking foolish at the front of the classroom. What colleges may not have taken into account is that to deliver

an HDTV set to the classroom means that the media flowing into that set from a media player needs to use HDTV signal as well. If the professor appears in the classroom with a VHS tape, the HDTV system is rendered useless. Colleges did not indicate any knowledge of this problem, and the one end user who was specifically asked about this issue was unable to offer any ideas about how the institution might face this problem. The colleges have not taken into account that conversion of existing media material, such as those materials found in library holdings, would require trained personnel to make old media materials work in a new system.

There are many factors to be taken into consideration in order to design and develop a good training program that will cause faculty and staff members to be more involved in technology. Any good training program will begin with determining current levels of competence of faculty and staff compared with the desired level. The program will not only evaluate skills but also realize the importance of issues such as gender and age in learning technology. Attitudes can be formed from previous experiences and backgrounds, so those attributes must also be considered. As Argyris (1998) reported, fear of looking less than competent often caused issues in training. Faculty and staff members who have had problems with technology in the past will not look favorably upon new technologies. Participants may need to be surveyed to discover their level of comfort with technology and to ascertain the amount of anxiety they experience when using or learning technology. Administrators must examine the type of environment they want to create. Will it be a relaxed, informal learning environment that encourages people to explore at a pace comfortable to them or will the institution mandate change in order to

keep everyone consistent? Before proceeding with training, decisions regarding how the training will be offered, its form, and duration will need to be answered. Support after training is critical to the long-term success of technology training.

Research Question 6

What projections, if any, do the Florida community colleges have of the total cost of the conversion?

Even though 50% (3) of the survey respondents said that the institution had prepared a budget for costs associated with HDTV, no community college produced such a budget showing the total cost of conversion. Indeed, that cost may not be known for several years after conversion becomes reality. As mentioned previously, items such as the cost of converting media materials have not yet entered into the awareness of most of those involved with HDTV. The cost of training people to make those conversions and for the equipment and materials needed has also been overlooked. Still, 93% (13) of the respondents listed cost as the most worrying issue concerning HDTV. Only 13% (2) of the respondents said that the cost issue was of least concern among the listed factors regarding the conversion. One interviewee reported that his institution spent 10% of the institution's annual budget on technology. For that school, technology was the second largest budget item, after salaries. Any implementation of technology that would have significant costs associated with it meant that either other technologies would have to be postponed or other budget categories would need to shrink in order to increase technology budgets. Oppenheimer (2003) reported that spending on technology drew

funds away from other areas of the institution such as infrastructure maintenance that could have long-term negative consequences.

Smallen and McCredie (2003) found that institutions often relied on the leftover pools of funds at the end of the fiscal year in order to purchase new technologies. They reported that such use of "budget dust" was not effective as a plan for technology that used the needs to the institution in a comprehensive plan. Perhaps Florida's community colleges hope that they will have enough "budget dust" to pay for HDTV.

Research Question 7

How do people within an institution perceive the transition?

Not surprisingly, those whose responsibility was daily use of technology were excited about HDTV. Conversely, those whose responsibility was to budget for new technology were a good deal more skeptical about the technology. According to researchers, particularly Rogers (2003) most new technologies have been requested by early adopters. Those technologies have either moved into mainstream use or were abandoned as early adopters found more exciting, newer technology. Administrators, thus, have a healthy distrust of the enthusiasm of end users for HDTV. Also, other trends in educational technology such as e-learning may have been costly mistakes for these colleges. What has separated HDTV from many other forms of technology is that it has been federally mandated as a change that affects all users of television. Administrators in community colleges who may prefer to take a "wait and see" attitude towards HDTV may find themselves in the distressing situation of having to replace broken NTSC

equipment with more expensive HDTV equipment that would not be compatible with other equipment, thus launching a larger purchase need.

Discussion and Conclusions

At the end of 2007, as electronic stores were filled with HDTV and HD had become a buzz word in the culture, Florida's community colleges did not seem well prepared to handle the conversion. Most did not yet have a total picture of all of the implications of the new technology. HDTV has been a technology that has been advancing for some number of years, and institutions have a responsibility to prepare for the conversion. Unlike other technologies which may appear on the market rather suddenly, the community colleges ample time to think about how to plan for the technological innovation regarding HDTV. Instead, they have squandered the time.

Administrators need to realize that technology has been and will always be both the problem and the solution, and no institution will ever reach a place where technology does not need to be upgraded or changed. People will always need training to maintain their knowledge of technology. Education administrators need to be concerned that they do not lose the talent that serves their institutions in the rush to be technologically advanced, for that talent truly is the soul of an institution. Well-developed training programs can help the institution through the conversion.

The people most likely to know about changes and to evaluate those changes are the end users who have the requisite expertise. Administrators need to trust their experts and use them to help make plans for innovations. Conversely, end users need to examine

their own motives for wanting new technologies and to make sure that the technology is appropriate for the institution.

Finally, higher education institutions need to use technology in a way that make sense both for the institution and for the people involved. Planning for technological advancement means aligning technology with the mission, goals and objectives of the organization. Leadership is needed that embraces technology as a tool for education and that seeks to help the institution learn what helps achieve its own goals. Technology is best used when it builds bridges, not when it creates walls.

Recommendations for Future Research

The analysis of the data for the present study led to the summary and discussion of findings and to implications for action within community colleges. Following are additional areas of research that are also proposed.

1. To what extent have Florida's community colleges advanced their plans for HDTV conversion since the time of the initial survey?
2. How do end users of technology differ from chief technology officers on their views on HDTV?
3. How will HDTV impact the use of television as a delivery means for classes at community colleges?
4. How are community colleges in other states and four-year institutions handling the HDTV conversion issues?

5. How does the budget process within the state impact the ability of community colleges to implement HDTV?

APPENDIX A
INSTITUTIONAL REVIEW BOARD APPROVAL LETTERS

University of Central Florida

Office of Research & Commercialization

May 23, 2005

Sharon Wyly
3236 Buck Hill Place
Orlando, FL 32817

Dear Ms. Wyly:

With reference to your protocol #05-2591 entitled, "Planning for the Future: The Advent of High Definition Television and the Impact on Florida's Community Colleges." I am enclosing for your records the approved, expedited document of the UCFIRB Form you had submitted to our office. **This study was approved by the Chairman on 5/22/05. The expiration date for this study will be 5/21/06.** Should there be a need to extend this study, a Continuing Review form must be submitted to the IRB Office for review by the Chairman or full IRB at least one month prior to the expiration date. This is the responsibility of the investigator. **Please notify the IRB when you have completed this study.**

Please be advised that this approval is given for one year. Should there be any addendums or administrative changes to the already approved protocol, they must also be submitted to the Board through use of the Addendum/Modification Request form. Changes should not be initiated until written IRB approval is received. Adverse events should be reported to the IRB as they occur.

Should you have any questions, please do not hesitate to call me at 407-823-2901.

Please accept our best wishes for the success of your endeavors.

Cordially,

Barbara Ward

Barbara Ward, CIM
IRB Coordinator

Copy: IRB file

12443 Research Parkway • Suite 302 • Orlando, FL 32826-3252 • 407-823-3778 • Fax 407-823-3299

University of Central Florida

Office of Research & Commercialization

June 5, 2006

Sharon Wyly
3236 Buck Hill Place
Orlando, FL 32817

Dear Ms. Wyly:

With reference to your protocol #06-3472 entitled, **"Planning for the future: The advent of high definition television and the impact on Florida's community colleges,"** I am enclosing for your records the approved, expedited document of the UCFIRB Form you had submitted to our office. **This study was approved on 5/21/06. The expiration date will be 5/20/07.** Should there be a need to extend this study, a Continuing Review form must be submitted to the IRB Office for review by the Chairman or full IRB at least one month prior to the expiration date. This is the responsibility of the investigator. **Please notify the IRB office when you have completed this research study.**

Please be advised that this approval is given for one year. Should there be any addendums or administrative changes to the already approved protocol, they must also be submitted to the Board through use of the Addendum/Modification Request form. Changes should not be initiated until written IRB approval is received. Adverse events should be reported to the IRB as they occur.

Should you have any questions, please do not hesitate to call me at 407-823-2901.

Please accept our best wishes for the success of your endeavors.

Cordially,

Joanne Muratori
UCF IRB Coordinator
(FWA00000351 Exp. 5/13/07, IRB00001138)

Copies: IRB File
LeVester Tubbs, Ed.D.

BW:jm

12201 Research Parkway • Suite 501 • Orlando, FL 32826-3246 • 407-823-3778 • Fax 407-823-3299
An Equal Opportunity and Affirmative Action Institution

APPENDIX B
SURVEY, COMMUNICATIONS AND CONSENT FORM

September 29, 2005

[name]
[institution]
[address line 1]
[address line 2]
[city] [state], [zip code]

Dear [name],

In a few days, you will receive in the mail a request to complete a survey that I am conducting for my dissertation research at the University of Central Florida.

The survey is looking at how the Florida community colleges are preparing for high definition television (HDTV).

I am writing you in advance of the survey so that you will know ahead of time about the survey. This survey, in addition to being an important part of my dissertation process, is also being used to benchmark the adoption of HDTV technology in the community colleges.

Thank you for your time and consideration. My research would not be possible without the help of professionals like you who are willing to take the time to answer my questions. If you have any questions, I can be reached at 407-579-5749 or at swyly@hotmail.com.

Sincerely,

Sharon Wyly
3236 Buck Hill Place
Orlando, FL 32817

P.S. I'll be enclosing a small gift with the survey as my "thank you" for your time.

Date

[name]
[institution]
[address line 1]
[address line 2]
[city] [state], [zip code]

Dear [name]:

I am writing you to ask for your help by completing a survey that I am conducting for my dissertation research at the University of Central Florida. I am asking chief technology officers or a person in an equivalent position at all of Florida's community colleges to tell me about their institution's plans for high definition television (HDTV). The job title is not particularly important to the survey. If you are the person in charge of making decisions on new technology for your institution, please answer the survey; if not, then please forward this survey to the appropriate person for your institution.

The survey is looking at how the Florida community colleges are preparing for HDTV. This survey, in addition to being an important part of my dissertation process, is also being used to benchmark the adoption of HDTV technology in the community college. Results from the survey will help me understand how community colleges plan and prepare for innovations in technology.

Completing the survey should take about 10 minutes. There are no "right" or "wrong" answers. The survey does not require any knowledge of HDTV to complete. The only information I am interested in is whether or not your college is thinking about HDTV and if so, to what extent the college has made plans. If your institution has not made plans to convert to HDTV, I would like to know that as well. If you have no plans to use HDTV, please answer questions #1 through #5 and #15 through #19. This will help me get an idea of how many colleges are considering the transition.

Your participation in this survey is voluntary; answers are completely confidential and will be released only in summary form. All names of individuals and of their institutions will be removed from the final report. Each survey does carry an identifying number so I can remove those who respond from the follow-up contact list. If you are willing to be contacted for a follow-up interview, there is a space on the survey for giving me your name and contact information. Other than that, you will not be contacted by anyone else for this survey. By participating in this survey, you are consenting to allow me to publish my results in statistical analysis form. The result of this survey can be made available you. If you have any questions about the survey, confidentiality or about the process, please feel free to contact me at 407-579-5749 or my faculty supervisor, Dr. Tubbs at the University of Central Florida; his number is 407-823-1466. Questions about a research

participant's rights may be directed to the University of Central Florida Institutional Review Board, 12443 Research Parkway, Suite 207, Orlando, FL 32826 or by calling the IRB Coordinator at 407-823-2901.

I am enclosing a small gift with the survey as my "thank you" for your time and consideration. Please respond by October 10, 2005; a stamped, return envelope is provided for your convenience. My research would not be possible without the help of professionals like you who are willing to take the time to answer my questions.

Sincerely,

Sharon Wyly

P.S. If you have any questions, I can be reached at 407-579-5749 or at swyly@hotmail.com.

HIGH DEFINITION TELEVISION (HDTV) & THE COMMUNITY COLLEGE QUESTIONNAIRE

Sharon Wyly

INSTRUCTIONS: Please mark an "X" in the answer box that best fits for each question below.

Start Here

1.	**What answer best describes your institution's broadcast facility?**	☐ We do not use any broadcasting facility. ☐ We use facilities loaned or leased to us by a local station. ☐ We use our own facility. ☐ Other: _____
2.	**Does your institution own broadcast equipment?**	☐ Yes ☐ No
3.	**Does your institution use broadcast television to deliver classes?**	☐ Yes ☐ No
4.	**How knowledgeable would you describe yourself on HDTV?**	☐ Very knowledgeable ☐ Knowledgeable ☐ Somewhat knowledgeable ☐ Not knowledgeable ☐ No opinion
5.	**To your knowledge, is your institution planning to convert to HDTV?**	☐ Yes ☐ No (please skip to #15, page 3)

Please continue on the next page.

INSTRUCTIONS: Please mark an "X" in the answer box that best fits for each question below.

Continue here

6.	**How complete are your institution's plans for HDTV conversion?**	☐ Very complete ☐ Somewhat complete ☐ Neither complete nor incomplete ☐ Somewhat incomplete ☐ Very incomplete
7.	**How do your institution's plans for HDTV conversion compare to other Florida community colleges?**	☐ Much more advanced than others ☐ More advanced than others ☐ As advanced as others ☐ Less advanced than others ☐ Much less advanced than others ☐ No opinion
8.	**How quickly will your institution convert to HDTV?**	☐ Very rapidly, plan to be among the first ☐ Somewhat rapidly, ahead of many other institutions ☐ About the same as the others ☐ Holding back, plan to see how other institutions convert ☐ Later conversion than the rest
9.	**Has your institution formulated an implementation plan for conversion?**	☐ Yes ☐ No
10.	**Has your institution prepared a budget of projected cost for conversion?**	☐ Yes ☐ No
11.	**Has your institution prepared a training plan for faculty and staff?**	☐ Yes ☐ No

Please continue on the next page.

INSTRUCTIONS: Please mark an "X" in the answer box that best fits for each question below.

Continue here

12.	**Identify those who most likely will be included in creating a plan for conversion:**		
	Faculty	☐ Yes	☐ No
	Administration	☐ Yes	☐ No
	Technical staff (IT)	☐ Yes	☐ No
	Non-technical staff	☐ Yes	☐ No
	Outside consultants	☐ Yes	☐ No
	Industry/Business partners	☐ Yes	☐ No
	Other:_____	☐ Yes	☐ No
13.	**Has anyone at your institution been assigned the responsibility for the conversion?**	☐ Yes ☐ No	
14.	**What is that person's job title?**	_____ Title	
15.	**Which factor about the conversion concerns you the *most*?**	☐ Cost ☐ Implementation ☐ Training	
16.	**Which factor about the conversion concerns you the *second most*?**	☐ Cost ☐ Implementation ☐ Training	
17.	**Which factor about the conversion concerns you the *least*?**	☐ Cost ☐ Implementation ☐ Training	

Please continue on the next page.

INSTRUCTIONS: Please mark an "X" in the answer box that best fits for each question below.

Continue here

18.	**What is your job title?**	_____ Title
19.	**If you are willing to be interviewed on this subject please list your name, phone number and email address.**	_____ Name ( ) _____ - _____ Telephone _____ E-mail

Please share any additional comments in the box provided below.

CONSENT INFORMATION

The purpose of this survey is to gather information for a study about the extent of planning by Florida's community colleges in preparation for the broadcast video format change mandated by the Federal Communications Commission to occur in 2007. The study will focus on three areas of preparation: planning, personnel and budgeting. This survey is designed to gather information about your institution's plans to convert to the high definition television format. Your participation in this survey is voluntary; answers are completely confidential and will be released only in summary form. All names of individuals and of their institutions will be removed from the final document.

Each survey does carry an identifying number so I can remove those who respond from the follow-up contact list. If you are willing to be contacted for a follow-up interview, there is a space on the survey for giving me your name and contact information. Other than that, you will not be contacted by anyone else for this survey.

This survey was designed solely for research purposes and no one but me will have access to your responses. You do not have to answer any questions on this survey that you do not want to answer and you may stop answering questions on the survey at any time. There are no direct benefits or compensation for participation. Answering the survey will take approximately 10 minutes of your time. There are no anticipated risks associated with your participation.

By participating in this survey, you are consenting to allow me to publish my results in statistical analysis form. The result of this survey can be made available you. If you have any questions about the survey, confidentiality or about the process, please feel free to contact me at 407-579-5749 or my faculty supervisor, Dr. Tubbs at the University of Central Florida at 407-582-1466. Information regarding your rights as a research volunteer may be
obtained from:
IRB Coordinator
Institutional Review Board (IRB)
University of Central Florida (UCF)
12201 Research Parkway, Suite 501
Orlando, Florida 32826-3246
Telephone: (407) 823-2901

Please keep this consent information for your records and do not hesitate to contact me if you have any questions. Thank you for your time.

Sincerely,

Sharon Wyly

Date

You recently received through the mail, a survey on HDTV that was sent to all of the schools in the Florida community college system.

If you have already completed the survey and returned it, I thank you for your time. I could not complete my doctoral research without your help. If you have not yet completed the survey, please take 5 minutes to complete it and mail it back today.

If you did not receive a survey or if it has be lost, please contact me at 407-579-5749 or at swyly@hotmail.com and I will send another one to you immediately.

Sharon Wyly

Date

[name]
[institution]
[address line 1]
[address line 2]
[city] [state], [zip code]

Dear [name],

About three weeks ago, I sent you a survey asking about your institution's plans for high definition television (HDTV). At this point, I still have not gotten a response from your institution.

Many of the other schools in Florida have given me their answers and I am able to incorporate the answers into my research on the impact of HDTV on community colleges. Since the survey was sent to only 28 people, it is very important that I hear from you in order to get a complete picture.

You may not have responded because you do not think you are the appropriate person at your college to be answering the questions. If you are the person in charge of making decisions on new technology for your institution, then you are the person that I want to hear from. If I have your name in error, then please forward this survey to the appropriate person for your institution. If there is no one at the institution who can answer this survey or if you are unwilling to participate, then please let me know by sending back the survey unanswered in the stamped envelope provided.

Just a brief word on my survey process. Each survey is marked with an identification mark so I can check off each name. The list of names will be destroyed once all responses are received. Individual names and institutions will not be associated with any specific response. Protecting your institution's information is important to me and I will take every step to ensure that your answers stay confidential.

I certainly hope that you will take the few minutes needed to answer the survey questions. If you are unable or unwilling to participate, please simply mail back your blank survey in the stamped envelope or send me a message to that effect.

Sincerely,

Sharon Wyly

P.S. If you have any comments or questions, I can be reached at 407-579-5749 or at swyly@hotmail.com.

Date

[name]
[institution]
[address line 1]
[address line 2]
[city] [state], [zip code]

Dear [name],

Over the last two months, I have sent you several letters asking about your institution's plans for high definition television (HDTV). At this point, I still have not received a response from your institution.

The survey was designed to look at how the Florida community colleges are preparing for HDTV. This survey will be a benchmark study on the adoption of HDTV technology in the Florida community colleges. I have received responses from 16 of the community colleges in the state and I want to include your institution in this study as well.

Your participation in this study is voluntary and confidential. I have included another copy of the survey in this envelope along with a stamped, addressed return envelope. If you have elected not to participate, then please let me know by sending back the survey unanswered in the stamped envelope provided. That way, I can take your name off of my mailing list and you will not get any future mailings.

I appreciate you taking the time to read my letters. Thank you for the cooperation.

Sincerely,

Sharon Wyly

P.S. If you have any comments or questions, I can be reached at 407-579-5749 or at swyly@hotmail.com.

APPENDIX C
INTERVIEWS: QUESTIONS AND CONSENT FORM

Interview questions for Chief Technology Officer

1. What types of technology do you plan for in the scope of your job?
   - Computers?
   - Audio/Visual presentation equipment?
   - Cameras?
   - Other technologies? (ask for examples)
   - Broadcast equipment? (for those colleges with a broadcast facility)?
2. I'm going to ask you about some types of technology. Tell me if you've heard of them. Have you heard about:
   - Podcasting?
   - Blackberry?
   - Open source?
   - VOIP?
   - WiFi?
   - HDTV?
3. Describe for me the process your institution uses to plan for new technology.
   - Would you describe it as top-down or bottom-up?
4. If I worked at this institution, how could I request some type of innovative technology that's not currently in use?
5. How does your institution prioritize new technologies for purchase?
6. How does your institution implement new technologies?
   - Do you have a training program to help people learn to use new technologies?
7. Can you tell me more specifically what you know about HDTV?
8. Does your institution have plans for HDTV?
   - (if yes) What are those plans?
   - (if no) Do you know why your institution has not made plans?
9. What about the conversion to HDTV concerns you? Is there anything in particular that you would consider to be a problem in converting?
10. How will you implement HDTV in terms of faculty & staff education and training?

Interview questions for Budget Officer

1. I'm going to ask you about some types of technology. Tell me if you've heard of them. Have you heard about:
   - Podcasting?
   - Blackberry?
   - Open source?
   - VOIP?
   - WiFi?
   - HDTV?
2. What process does your institution use in preparing a budget?
3. How does your institution plan for new technology?
   - Would you describe it as top-down or bottom-up?
4. How does that process deal with the cost of new technology?
5. Who within the college selects or decides on new technologies?
6. How does your institution prioritize new technology purchases?
7. Does your institution have a long term (5 years or longer) plan for purchasing new technology?
8. Can you tell me more specifically what you know about HDTV?
9. Has your institution made any plans for budgeting for HDTV?
   - (if yes) What are those plans?
   - (if no) Do you know why your institution has not made plans?

Interview Questions for End Users

1. I'm going to ask you about some types of technology. Tell me if you've heard of them. Have you heard about:
   - Podcasting?
   - Blackberry?
   - Open source?
   - VOIP?
   - WiFi?
   - HDTV?
2. What are your main sources for learning about new technology?
3. What is your process for requesting or receiving new technology for your area?
4. Who has the responsibility within your area/department/program to select new technologies?
5. How does your institution plan for new technology?
6. How does your institution prioritize new technologies?
7. Can you tell me more specifically what you know about HDTV?
8. Do you plan to request HDTV for your area?
9. Why/why not do you plan to use/not use HDTV?
10. What would you like to know about HDTV during this time of planning?

CONSENT FORM – INTERVIEW

The purpose of this interview is to gather information for a study about the extent of planning by Florida's community colleges in preparation for the broadcast video format change mandated by the Federal Communications Commission. The study will focus on three areas of preparation: planning, personnel and budgeting. This interview is designed to gather information about your institution's plans to convert to the high definition television format. Your participation in this interview is voluntary; answers are completely confidential and will be released only in summary form. All names of individuals and of their institutions will be removed from the final document.

This interview was designed solely for research purposes and no one but me will have access to your responses. You do not have to answer any questions in this interview that you do not want to answer and you may stop answering questions during the interview at any time. There are no direct benefits or compensation for participation. Answering the interview will take approximately 20 to 40 minutes of your time. There are no anticipated risks associated with your participation.

With your permission, I would like to audiotape this interview. The tapes will be coded for confidentiality. The tapes will be transcribed and quotes from the transcriptions may be used in the study. The quotes will not identify the subject or the institution. All tapes will be destroyed after transcription.

By participating in this interview, you are consenting to allow me to publish my results in statistical analysis form and to quote from the transcripts. The result of this interview can be made available you. If you have any questions about the interview, confidentiality or about the process, please feel free to contact me at 407-579-5749 or my faculty supervisor, Dr. Tubbs at the University of Central Florida at 407-823-1466. Questions about a research participant's rights may be directed to the University of Central Florida Institutional Review Board, 12443 Research Parkway, Suite 207, Orlando, FL 32826 or by calling the IRB Coordinator at 407-823-2901.

Sincerely,

Sharon Wyly

CONSENT FORM – INTERVIEW

_____ I have read the procedure described above

_____ I am over 18

_____ I voluntarily agree to participate in the procedure

_____ I would like to receive a copy of the procedure described above

Print name:_____

Signature: _____

Date: _____

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