LEADERSHIP APPROACHES FOR EFFECTIVE
TECHNOLOGICAL CHANGE IN COMMUNITY COLLEGES

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Abstract

Constantly changing technology requires community colleges to upgrade and seek training to ensure that their teaching stays current (Keengwe, Kidd & Kyei-Blankson, 2009). Yet there is little published about proven methods that guide a college to selecting and implementing appropriate technological enhancements. This study uses interpretative phenomenological analysis (Smith, Flowers, & Larkin, 2009) to reflect on stories gathered among various levels of community college personnel about their journey to implement technological improvements on their campus. Using the Diffusion of Innovations theoretical framework (Rogers, 2003), these elements are examined to pinpoint how innovations are supported through multiple facets in the community college setting. Through semi-structured interviews, community college administration, faculty and staff were asked to examine and reflect on successful and unsuccessful attempts at implementing technological change on their campus reflecting on the top-down and bottom-up influences (Kezar, 2012). This study seeks to provide approaches and recommendations to all levels of employees at community colleges when considering technological change at their campus.

*Keywords*: bottom-up leadership, community college, Diffusion of Innovations, higher education, Interpretative Phenomenological Analysis, IPA, technological change, top-down leadership, undergraduate
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Chapter One: Introduction

In trying to align with workplace demands and best practices in education, community colleges encounter hurdles when seeking technological improvements (Ranjan, 2008). Some of the factors that prevent technological improvements are: budget constraints, infrastructure needs, lack of strategic planning, resistance of stakeholders to technology, and overall resistance to change (Abrahams, 2010; Farrukh & Singh, 2014; Gopalakrishnana, 2011). As a result, some technology advancements have been initiated from innovative faculty and staff who use workarounds and creative solutions to the problems they encounter (Anderson & Dexter, 2005; Baran, Correia & Thompson, 2013; Kezar, Bertram Gallant, & Lester, 2011).

Research to date has focused on the reasons behind faculty resisting technological innovation on their campus due to lack of self-confidence, experience, and supporting infrastructure (Brinkerhoff, 2006; Johnson, Wisniewski, Kuhlemeyer, Isaacs & Krzykowski, 2012; Park & Ertmer, 2007). When changes occur, additional training may ensure that those who use the modified technology are prepared to reduce any potential delays the updates may cause (Keengwe, Kidd & Kyei-Blankson, 2009). Appropriate leadership, which is essential when changes in technology need to happen, may inspire individuals to embrace the impending change (Sabherwal, Hirschheim & Goles, 2013). Those who pursue the change can either be in a position of power or work within their administration to make necessary changes (Kezar, 2012). Often times, individuals who desire to make technological improvements at their college meet resistance (Attuquayefio & Addo, 2014). In these cases, there may be continual setbacks, hindering their objectives, and workarounds are pursued, causing delays in implementation (Ferneley & Sobreperez, 2006).
**Statement of the Problem**

Technological change since the last years of the 20\textsuperscript{th} century and now into this century has been constant (Johnson, Adams Becker, Cummins, Estrada, Freeman & Hall, 2016). The impact is felt in educational institutions, including community colleges, which often lack sufficient funding for and expertise in implementing technological change (Ferneley & Sobreperez, 2006; Ranjan, 2008).

In particular, it is important to understand the strategies and processes community college leaders use to implement technological change and innovation on their campuses (Kezar, 2012; Ranjan, 2008). One facet that has not been investigated is an examination of the strategies and processes used by leaders to successfully guide high-tech innovations across different functions, levels, and roles of the college. For this research study, data was derived from reflections of community college faculty and staff on how technical innovations persist and spread (Rogers, 2003); however, specific attention was placed on strategies and processes involved in technology leadership for innovation and change (Kezar, 2012). In particular, this study uses the Diffusion of Innovations (DoI) theoretical framework (Rogers, 2003) to identify how innovations are supported through multiple facets in the community college setting.

With the increased push for community colleges to support diverse student needs, colleges are required to reach students using a wide array of technological methods. Various areas of a college meet this demand in different and unique ways, working together to ensure a seamless business model for today’s students. This study examined approaches of various college members, including faculty, staff, and administrators, who implemented technological advances at their college to determine the process and strategies that were required for successful implementation strategies. Findings from the study could inform professional practice; thus,
they could be of interest to faculty, staff, and administrators serving in public community colleges.

**Research question**

There is a need for research to understand leadership in a community college that allows appropriate change and enhancement within a department including technological innovation (Sadeghi & Pihie, 2013). In particular, the bottom-up leadership of faculty and lower-level administrators who work to implement technological change in their campus environments has not been explored (Kezar, 2012). This leads to the core research question:

*What are the main factors and relationships that allowed a technological change to occur within a community college?*

In addition, there are underlying structural questions

1. How do individuals who propose a technological change on a campus approach campus leadership and policy to implement their project?
2. How did leadership approaches allow or inhibit technological changes in the community college?

The research questions focused on the need within community colleges today to adapt to ever-changing trends in technology. Research revealed that many movements to improve technology on a college campus start with demands from outside the institutional environment (Amey & VanDerLinden, 2003; Kezar, 2012; Ranjan, 2008). These demands may come in the form of faculty who need to enhance classroom technology to meet the requirements of area industry needs or accrediting agency reporting requirements for the college (Barber, 2011; Harryson, Dudkowski & Stern, 2008).
Due to such diverse requirements, it is important for institutions to create a technological vision and plan that remains flexible (Chang, 2012). This adaptability is vital to ensure that college faculty and staff have the ability to make needed requests for enhancements that follow the institution’s mission and vision. According to Rogers (2003), DoI is particularly well suited to analyze the method of adopting new technical innovations (Sahin, 2006) in the proposed research. Rogers (2003) states, “a technology is a design for instrumental action that reduces the uncertainty in the cause-effect relationships involved in achieving a desired outcome” (p. 13). This is the ideal goal of the research, to explore the relationships existing and created that allow for an individual or group to modify and enhance technology at their institution to improve educational objectives. By choosing a qualitative approach, the interviewees provided a first-hand account of their experiences and reflections guided through open-ended questions (Creswell, 2013).

Because technology impacts all areas of a college through integrated and stand-alone methods, the intended focus of this research is to examine perspectives of varying positions at multiple levels across a community college. The research examined reflections from a variety of distinct positions across the community college campus. This broad scope shows the multi-faced nature of technology implementation today in the college environment and considers approaches looking to advance technological innovations.

The interview questions (see Appendix D) allowed the participants to talk about their personal experiences relating to campus leadership and policy and how that leadership encouraged or inhibited technological changes that they pursued. After the participants discussed their specific roles and responsibilities at the college the interview questions shifted to

1 Detailed discussion of DoI begins on page 15.
reflect on their interactions with technology issues on campus. The open-ended questions gathered information about the participants’ understanding of their campus policies regarding technology pursuits and their personal preference on approaches to incorporate new technology in their jobs.

Looking into the leadership roles, participants were asked about their interactions with the computer services area on campus and specifically the Chief Information Officer (CIO). Next interviewees were requested to give an example of a technological change that they were a part of that they considered successful and another example that they said was not successful. Reflecting over these experiences, participants were asked to outline the methods that they would pursue now if they had a new technological change that they would like to implement. Overall the questions provided a foundation to stimulate the interviewees to consider and reflect on their experiences with the college in regards to technological innovation procedures and practices.

Theoretical Framework

In order to remain current and responsive, community colleges adapt to changing area business needs and enhance their offerings with technological innovations that best meet those demands (Barber, 2011; Harryson et al., 2008). This research examined the ways that individuals working at different levels within an institution engage in technological improvements on their campus.

Turner (2014) found that creating effective technology leadership teams was instrumental in ensuring an effective implementation. Successful team attributes include a team member’s clear understanding of the current institutional procedures and their ability to work beyond the traditionally-assigned roles. At times when current procedures inhibit the efforts of the team, it is vital that the team remain flexible and seek novel solutions to their concerns (Turner, 2014).
While studies on diffusion of innovation (DoI) have spanned fifty years, Rogers (2003) focused on the idea that diffusion applies to a human social system over time. Considering this social aspect allows for more direct insight into the complex relationships and influences technological innovation within the hierarchy of personnel on a college campus. Therefore the theoretical framework of this research focused on the concept of DoI coined by Rogers (2003), which aligns with technologically-focused education research (Sahin, 2006).

**Diffusion of Innovation.** There are four main elements in the DoI framework: innovation, communication channels, time and social system. The area of innovation includes new ideas, practices or projects that may have to overcome an amount of uncertainty before being adopted. While technological innovation is still largely an underexplored research area (Schneckenberg, 2009), the use of technology in the form of hardware and software is ever-present in college environments (Abrahams, 2010). According to Rogers (2003), technological innovation consists of five components: relative advantage, compatibility, complexity, trialability and observability.

When exploring an innovation’s rate of adoption in a given setting, the first two components are fundamental (Cho, Hwang & Lee, 2012). The relative advantage of a technology targets the perceived impact that a new innovation merits; therefore, the greater the relative advantage of an item, the quicker the adoption of the innovation (Sahin, 2006). The later component, compatibility, is identified as the level of commonality between existing values and needs of the potential adopters and is embraced more readily if a prior system enhancement was already approved. The Delphi technique focuses on these two components by identifying key stakeholders from the college, and incorporating their recommendations into the proposed
technological innovation to increase the potential to adopt the technology (Wannasiri, Xaymoungkhoun, Zo, Rho, & Ciganek, 2012).

The second element, communication channels, allows selected information to travel from one person to another (Rogers, 2003). The methods of communication may be very diverse when considering mass media or interpersonal channels, the latter proving more effective when there is a high level of homophily between the individuals (Cho et al., 2012). Homophily is the level of similar characteristics and attributes between the interacting individuals (Aral, Muchnik, & Sundararajan, 2013). In either method of communication, the audience and overall goal assist in identifying the means of delivering the message (Barnard, Bradley, Hodgson, & Lloyd, 2013).

Time is the third and most ignored aspect of the DoI process (Rogers, 2003). The first aspect of this diffusion element is the Innovation-Decision (ID) process; an “information-seeking and information-processing activity in which an individual is motivated to reduce uncertainty about the advantages and disadvantages of the innovation” (Rogers, 2003, p. 14). A visual depiction of the ID process is shown in Figure 1 (Poorangi, Khin, Nikoonejad & Kardevani, 2013). This model shows the multistage time-ordered process that begins with the knowledge aspect where an individual learns about the new innovation, but it is not until the second step when one considers the potential implementation of the technology.

In the decision phase, one makes a choice to adopt or reject the new innovation (Henderson, Dancy, & Niwiadomska-Bugaj, 2012). If one determines to adopt the new technology, the fourth stage of implementation allows the user to apply their knowledge and try the new techniques. This leads to the final stage where, after trying the new technique, the implementer determines to either adopt the new technology or to forgo future implementation (Rogers, 2003).
Limitations. Any new innovation must consider and allow for the time that it takes to implement or accept the proposed change (Harryson et al., 2008). There are several limitations to the diffusion processes: pro-innovation bias, individual-blame bias, recall problem and equality concerns. The assumption that the innovation should be adopted at some point and result in a positive outcome, often ignoring the possibility of reinvention, leads to the pro-innovation bias (Tolba & Mourad, 2011). Furthermore, it is challenging to track changes for unsuccessful diffusion and unsuccessful innovations (Rogers, 2003). Fortunately, Baumann and Martignoni (2011) discuss a method to ensure that the pro-innovation bias is limited in interviews by recommending a focus on both successful and unsuccessful projects of interest.
The second area of concern is the individual-blame bias that occurs when an individual becomes the focus of an interview instead of the larger system the person is a member of (Rogers, 2003). To combat the issue of focusing research on an individual within the system, Ramsever and Winter (2013) encourage the researcher to keep an open mind and recommend incorporating questions to probe the individual’s division including questioning individuals with varying levels of responsibility in the selected college while including the social unit as the unit of analysis.

The issue of recall leads to another area of concern where interviewees may incorrectly remember details of the time around the newly adopted innovation (Rogers, 2003). Some issues may be ameliorated by recalling concerns by researching a case study from one institution with multiple interviewees discussion similar events allowing for a cross check of the acquired data (Colby, Clark, Rogers, Ramsey, Graham, Boergers & Abrams, 2012). By also conducting interviews within a narrow time window with individuals at all levels of an organization, recall bias concerns may be reduced further reduce (Rogers, Christensen, Welsh & Faseru, 2015).

The final area of concern around DoI includes the issue of equality, where “socioeconomic gaps among the members of a social system are often widened as a result of the spread of new ideas” (Rogers, 2003, p. 135). To ameliorate this concern, it is encouraged to include a diverse representation of interviewees spanning income, ethnicity, age and time of employment (Fokkema, Teunissen, Westerman, vander Lee, van der Vleuten, Scherpbier & Scheele, 2013). Furthermore, keeping the number of interviewees less than ten allows for a smaller data set and results in a rate of adoption of the innovation (Shimogawa, Shinno & Saito, 2012).
The standard rate of adoption of the innovation over time follows an S-shaped curve where the steepness increases with an escalated speed of implementation (Rogers, 2003).

Population trends for innovativeness following the five adopter categories are discussed in detail in figure 2 in the next chapter.

Lastly the social system element holds the greatest influence over the final adoption of a new innovation due to preexisting preferences and history (Ranjan, 2008). Within the social system, the opinion leaders of a social network are able to influence adoption among others in their group, particularly if the leaders are highly social (Cho et al., 2012). To ameliorate this concern, Rogers (2003) recommended selecting interview candidates that have prior experience initiating or being a member of an innovation and focusing the interview questions on the consequences of their actions, one of the main areas of concern within the social system.

Summary and Organization of the Study

This thesis reflected on effective methods of influencing and changing technological initiatives on a community college campus using DoI as the theoretical framework (Rogers, 2003). Chapter one concludes with a discussion of the previously mentioned theoretical framework. Chapter two contains the literature review section focusing on the diverse areas of a college connected to technological change, along with the impact of active technological leadership and vision for a college. Chapter three includes a description of the research design including the research methodology, the site and participants, data collection and analysis methods, and measures to ensure that the integrity of the findings. Included in this section of the thesis is the protection of human subjects particular to this study and the procedures to protect the human subjects and ethical challenges. Chapter four discusses the study findings, and
chapter five relates these findings to the available literature and theories of DoI (Rogers, 2003) and interpretative phenomenological analysis (IPA) (Smith, Flowers & Larkin, 2009).
Chapter Two: Literature Review

Introduction

There are many key areas of a college that manage to ensure functional and timely delivery of services; “community colleges [are] increasingly buffeted by global social, political and technological forces” (Barber, 2011, p. 75). One of the largest components serving the mission of all colleges is the area of academics, where the focus among faculty and staff is teaching core concepts that eventually culminate in the ability of a student to earn a credential. Another integral area is the student services, which can include registration, financial aid, and student organizations (Amey & VanDerLinden, 2003). On the financial side, finance and purchasing teams ensure that needed supplies are available for all areas of the college and that salary payments occur timely, supporting the mission of the college (Crotts, Dickson & Ford, 2005).

Among the many aspects to consider whether or not to implement a new technology include the cost in personnel, time, software and hardware, institutional mission, infrastructure and alignment to the campus strategic plan (Abrahams, 2010; Boudreau, 2005; Ngai, Law & Wat, 2008). Integral to all of these core campus components is the technology that provides technical assistance and support for all campus services. The breadth of the duties for this area of a college often fall under the jurisdiction of the chief information officer (CIO) who protects and facilitates the technology needs on their campus (Drury, 2009; Maglyas, Nikula & Smolander, 2013). Several of the outputs for this area, including campus online course delivery systems and dashboards to evaluate the effectiveness of various divisions on campus, but there is little discussion about the way that a university reflects on the strategic management of technology that is vital to the life of each college campus today. The decisions that
administration, faculty, staff and students make concerning technology usage on their campus are vital as this one feature touches every facet of campus life (Barber, 2011; Minamoto & Nishigori, 2014). Lastly the adoption barriers that inhibit a successful implementation of a campus-wide software package are discussed before the summary of the research.

**Considering Technology**

There are many reasons that a college may choose to review their current technological situation and reflect on the possibility of modifications. While there is not a single model to follow when reflecting on changing technology, there are many methods to help outline and reflect on potential changes to determine their applicability at a select location (Chowdhury, 2015). Another factor to consider is the willingness of individuals to adopt new strategies based on their personal preferences and ability to embrace new innovations (Barber, 2011). The distribution of new adoptions can be seen in Figure 1 and shows the need for inventors of new approaches to be patient and tailor any expectations of technology adoption. This theory follows Rogers (2003) projections that early adoption of a new approach happens slowly, building over time until a critical mass is acquired and the technique is widely accepted (Ranjan, 2008).
Barriers to Technology Adoption in Higher Education

In addition to the personal consideration when looking at the ability of adopting, there are also barriers due to the type of technology that is being imputed. Attuquayefio and Addo (2014) found that there were six barriers. The first is a lack of teacher confidence in their ability to apply the new technology (Farrukh & Singh, 2014), which inhibits their desire to try new techniques and approaches. The second finding was a general resistance to change accompanied by a negative attitude about the idea of implementing modifications from currently used approaches (Liu, 2011). In addition to the prior barriers, the authors found that the potential
implementers identified that there was not enough time to implement the new strategy in the classroom involving modified technology (Liu, 2011).

Another barrier to implementing a new technology includes the lack of training that the new implementer is able to obtain to gain comfort with the new approach (Hew & Brush, 2007). This follows the idea that incomplete access to needed resources would help allow for a smooth implementation of the new technology (Liu, 2011). Finally, the inability of the potential implementer to have appropriate support from their institution stands in the way of a smooth transition (Wright & Wilson, 2011). The next section continues with the issues and concerns brought about when new technology is considered for a college environment.

There are varying issues at a college that inhibit the transition to new technological advances. Keengwe, Kidd and Kyei-Blankson, (2009) interviewed 25 representatives of a Midwest college in areas of academic and technology leadership positions. Some of the challenges that their interviewees identified as barrier issues to implementing new technology included

- Limiting policies and procedures
- Inhibiting infrastructure resources (Moloney & Oakley, 2010)
- Identifying a clear connection to the mission, vision and goals

Therefore, the survey concluded that the following were needed to ensure a smooth transition to new technology

- Organizational pre-assessment to determine the campus culture towards technological transitions
- Creating a technology vision that aligns with the college’s academic mission and vision
- Providing appropriate training for the technology implementers
Building on the latter idea from Keengwe et al. (2009), Aldunate and Nussbaum (2013) found that successful implementation of new technology by faculty occurs when new adopters are allowed time to train on the new technology and integrate the software or hardware into their lessons immediately. Aldunate and Nussbaum (2013) found that the complexity of the technology had little impact in the successful adoption of new technology.

Many of these concerns are also found when implementing online curriculum. Gopalakrishnana (2014) found that a lack of faculty acceptance of online education is one of the most inhibiting factors. This faculty concern is rooted in the lack of incentives for faculty to transition to a new delivery format that changes content delivery methods. Machado (2012) found that faculty commonly weren’t engaged or supported when having to make such significant transitions. Baran, Correia and Thompson (2013) also found that this resistance stems from the faculty not clearly understanding the value and methods used in delivering curriculum in a technical format without receiving appropriate training. Transitioning to an online course offering requires faculty to be willing to learn techniques of delivery outside of their standard curriculum and interact with technologists to support the delivery mechanism (Drape, Westfall-Rudd, Doak, Guthrie & Mykerezi, 2013).

When there are barriers to technological change, often faculty and staff look for workarounds to address the needed areas of concern (Ferneley & Sobreperez, 2006). These solutions are usually not as technologically demanding, but time-intensive. For example, hand-counting the number of students enrolled in a particular program may be a solution if the current student database does not allow the possibility of querying program majors. In some cases, providing technology boot camps for training faculty and staff helps to decrease anxiety and increase self-confidence to work with the new technology (Johnson, Wisniewski, Kuhlemeyer,
Isaacs & Krzykowski, 2012). But when the need for technological change arises, an institution also considers the reason why current tools and culture do not meet the needs of the college (Ferneley & Sobreperez, 2006).

In many cases, workarounds become a preferred solution when there is a lack of faith in the existing software programs to perform their tasks accurately and when there is an immediate requirement of data beyond the ability of the currently used programs (Ferneley & Sobreperez, 2006). Unfortunately, the creation of independent workarounds may create organizational disruption and must be handled carefully by implementers of technological change (Rivard & Lapointe, 2012). In the next section, Kezar’s (2012, 2013) work on leadership styles is discussed in relation to technological modifications at the college level.

**Kezar’s Distributed Leadership**

The conceptual framework of distributed leadership (DL) (Kezar, 2012, 2013; Kezar, Bertram Gallant & Lester, 2011; Kezar & Lester, 2011) is the attempt for upper administration, using a top-down leadership style, to use grassroots-level support to pursue their agenda items. The conceptual framework of DL focuses on how members of an organization “circulate information related to an innovation through specific channels” (Hsu, 2015, p. 2). The breadth of individuals who are able to influence change has not been explored in extensive detail from a bottom-up approach (Kezar, 2013).

Prior research has examined the role of distributed leadership in a top-down and bottom-up framework to make large-scale technological changes in secondary education (Kezar, 2012; Turner, 2014). Kezar’s (2013) conceptual framework, explores change management approaches that occur both at the grassroots level where individuals are governed by other bodies within a college and by administrative leaders with authority over employees. The latter framework
known as top-down leadership occurs from the highest level of management and filters down to subordinates (Kezar, 2012).

There is a small amount of research about how transformational change occurs within a college when considering a bottom-up approach (Kezar, 2012). Commonly, faculty, staff, students or administrators with limited authority commonly originate these initiatives. When initiatives on a campus occur, Gioia and Chittipeddi (1991) found three factors that can guide the transformation: campus-wide engagement across divisions, open discussions on strategies and barriers, and campus personnel focus on the multifaceted processes of sensemaking and sensegiving (Maitlis & Christianson, 2014).

In a survey of seventy-five faculty leaders, Kezar, Lester, Carduci, Gallant, and McGavin (2007) found that “faculty leadership is necessary for high-quality teaching, innovative curriculum, cutting-edge research, intellectual enrichment, student engagement, improved student outcomes, greater faculty citizenship, a more democratic environment, a campus more responsive to community needs and other important outcomes” (Kezar, Lester, Carduci, Gallant, & McGavin, 2007, p. 21). Effective change in a college occurs when faculty leaders develop strong personal relationships with their administration and work to benefit their students (Kezar et al., 2007). To encourage this leadership, the study found that faculty need to be compensated and recognized for the time that they spend working beyond their educational course requirements for the betterment of the college.

Kezar (2013) further found that the focus of bottom-up change obtains a multi-tiered support and addresses concerns and associated barriers at all levels across the campus environment. These focused changes require constant attention and support when activated with a bottom-up approach. Furthermore, transformational change occurs in bottom-up and top-down
leadership styles conducted by both the individual and the organization in which a new innovation is being implemented (Kezar, 2013). Kezar and Lester (2011) state it is essential that administrators are on-board with the change process and provide any needed support, resources and structure.

**Leadership of Change**

When an organization implements a change, strong guiding leadership is fundamental to ensuring the success of the modifications (Yukl, 2013). While institutional leaders may take varying approaches to institute change, the need for technological leadership is fundamental to ensuring the successful adoption and transition to a hi-tech implementation (Ulrich, 2011). This leadership style is one facet of a core leadership style that incorporates the use and understanding of fundamental technology knowledge among the other leadership qualities (Hsu, 2015).

An individual may display charismatic, transformational, ethical, servant, spiritual and/or authentic leadership traits (Yukl, 2013), but in addition to this core behavior, they also incorporate the knowledge of currently used technological advances. To create an effective process for change on campus, Kezar, Carducci, and Contreras-McGavin (2006) found that leadership, relationships and trust are vital. Effective leadership focuses on outcomes and providing direction while building relationships that allow for civil debate and respect for each other’s opinions. The trust between faculty and administrators is especially vital with a constant need for reflection and modification for campuses that implement technological changes (Kezar, Carducci & Contreras-McGavin, 2006).

The idea of technology leadership first arose in automobile manufacturing, where executives and managers understood that they needed to better direct their products to keep up with world-wide changes in technological advancements (Ulrich, 2011). Fundamentally, this
type of leadership helps ask the questions focused on advancing products using today’s technology (Anderson & Dexter, 2005). This marriage of technology with current roles and responsibilities becomes instrumental to the leadership style and the ability of those in charge to understand the details associated with potential change (Wu, Thames, Rosen & Schaefer, 2013).

As colleges make the decision to adapt to their changing environments using the benefits of technology, there are considerations for large-scale technological implementations. As Turner (2014) discusses in reference to secondary education, individuals often do not consider the possibility of moving to increased technology, but reflect on when and how the new technological adoptions take place. In considering an extensive modification in an educational environment, Turner (2014) found the following areas of leadership essential:

- Distributed leadership (Turner, 2014)
- Instructional vision (Chang, 2012)
- Professional learning communities (Nolin, 2014)
- Technology decision-making (Arnold, 2014)
- Administrative use and attitude about technology (Cohen, 2014)

It is the combined influence of the five traits above that can lead to the success or failure of adapting to a new technology in a quick and effective manner. Adapting to these trends requires an added leadership quality, technology leadership (Anderson & Dexter, 2005).

**Technology Vision**

Often times, by the point a new technology is approved through traditional channels at a college, the need is outdated and warrants modification immediately (Anderson & Dexter, 2005). Therefore, creating a timeline for the technological change is vital to ensuring the needed
modifications occur in an appropriate duration considering the impacted people, places and infrastructure (Hew & Brush, 2007).

When implementing a new technology, Boudreau and Robey (2005) reviewed concerns that arise before, during and after the technological change. Initially, organizations consider a potential new implementation by looking at the way the technology was created, the institutionalization of the innovation, the importance of the technological change, consequences, impact throughout the institution, and transition of the human interaction with the addition of the technology (Boudreau & Robey, 2005). Many plans focus on what businesses would consider when reflecting on an overarching information systems plan. Mohamed and Kaur a/p Gian Singh (2012) identified five key characteristics to consider for computer system modifications

1. Organizational demographics
2. Information intensity
3. Organizational culture
4. External environment characteristics
5. IT function characteristics

Core to the outlined process is the identification of the need to implement a dynamic process that can change with the business’ evolving needs and the new availability of technology. Amey and VanDerLinden (2003) found that most colleges did not complete long-term planning for technology at their institution, creating silos of technological implementation.

To examine the relationship in more detail, Maglyas, Nikula and Smolander (2013) found that there is a clear connection between the proposed technology plan and the implementation. He also found that there is no clear need for support from administration when implementing a plan focused on technological modifications. Maglyas et al. (2013) identified the core reason
behind this finding as the need for management to approve the initial plan and strategy approach but not the implementation details that are associated with the execution.

**Technology Leadership**

Among the broad types of leadership, there is an increased focus on a leadership style that embraces and adapts with changes in technology (Anderson & Dexter, 2005). This technology leadership approach requires an understanding by leaders of the upcoming changes in technology and the ability to connect modifications to company strategy (Sabherwal et al., 2013). This leadership style focuses on meeting the needs of consumers today while planning for a technology-enriched future.

Harryson et al. (2008) identified some of the key characteristics for this leadership approach, which include the ability to:

1. Unlearn outdated information
2. Acquire new knowledge
3. Learn and adapt to change
4. Implement a new idea in a timely manner

Amey and VanDerLinden’s (2003) survey results indicated administrators in community colleges need to make sure that faculty working with technology receive overload or release time to appropriately integrate the technological changes in their classroom. Yet, the survey respondents did not specify a strong need for administrators to be competent in technology. This encourages the bottom-up (Kezar, 2012) leadership approach where the needed technology changes originate from the faculty pedagogical and curriculum needs, supported by the administration. The main interest for administration that the survey respondents stated was a clear:
1. Plan for the implementation of the technology
2. Focus on pedagogical needs with faculty training and support
3. Update to institutional procedures and policies to embrace the new technology
4. Alignment with institutional goals

To accomplish these diverse goals, survey respondents also stated that there was a well-defined working relationship with the chief information officer (CIO) on the campus.

Conclusion

This chapter reviewed some of the main issues that create roadblocks and obstacles to pursuing technological change at a community college. The chapter looks at the fundamental driving force that encourages community colleges to modify their current technology. There are many potential barriers to early adoption of technology in the educational setting. Inhibitors are also seen in Rogers’ (2003) five-stage Innovation-Decision Process. In many cases, technological change involves the CIO of the college who maintains the technical infrastructure of a campus environment. Technological change within the college requires a partnership and guiding leadership style that adapts with changing technological trends. A collaborative and cooperative environment allows fluid sharing of ideas. This chapter reviewed distributed leadership with a focus on the conceptual framework of Kezar’s (2012) bottom-up and top-down leadership styles.

Lastly, the relationship that the college mission and vision play in directing technological change is vital in guiding a college to a common goal. As in the case of adding a new enterprise resource planning (ERP) system, it is important that analysis of a new technology occur before, during and after implementation to ensure that the project goals are being successfully achieved with the chosen technology (Dezdar & Ainin, 2011). Ensuring a collaborative environment with
all levels of leadership in the college assist in motivating technological changes within their college. This leadership also embraces change to assist in the ability of a college to adapt to the ever-changing technology and campus demands.

Combining the ideas across the literature, a common theme arises. Colleges that maintain a clear and adapting technological vision aligned with the institution’s vision and mission statements create a foundation where innovation is embraced. Yet, each college serves a unique and diverse student population requiring cooperation among multiple levels of the college to ensure the ability of an institution to remain technologically competitive.
Chapter Three: Research Design

Methodology

The focus of this research was to investigate the lived experiences of community college faculty and staff who have inspired technological changes on their campus. To meet this goal, a qualitative process (Creswell, 2013) was the ideal platform to explore the perspectives of individuals at several levels in an institution in terms of their role in technological change, their established relationships and interactions with fellow employees, and the ways that needed technological modifications materialize on their campus.

The qualitative process allowed the study to focus on the interviewee’s “natural setting, attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them” (Denzin & Lincoln, 2011, p. 3). A qualitative approach aligns well with the research topic as the goal of the research is to identify the personal relationships and elements that encouraged and hindered the technological change on the interviewee’s campus. One of the fundamental ideas qualitative research focuses on is “learning the meaning that the participants hold about the problem or issue” (Creswell, 2013, p. 47). Therefore the interviewee is empowered to share their story and experience from their perspective (Fassinger & Marrow, 2013). Furthermore, the research focused on the social constructivism paradigm (Creswell, 2013), where the interviewee shared their understanding of the experience of integrating technology on their campus.

To align with the research question for this study, the interview questions were prepared to guide the interviewee to discuss their interaction with others invested in the technological change, including their perception of the social and chronological events (Schwandt, 2007). The study aligned smoothly with a qualitative research focus, in particular the social constructivism
perspective, and guided the design of the study in a phenomenological direction (Moustakas, 1994).

Phenomenology seeks to examine an experience in the way it occurs (Smith et al., 2009). This attitude requires the observer to examine and reflect on an experience sharing a unique and personal viewpoint of the situation (Husserl, 1927). Encouraging the individual to describe the world and their experience as it appeared to them follows the phenomenological concepts from Heidegger (1962) that individuals are immersed in an ever-moving world filled with relationships and items binding individuals to others. Therefore, it is important to identify each interviewee in the study in relation to their current position, interactions and situation. This allowed for one of the key aims of the study, to ensure a true understanding by the researcher of the interviewee’s perspective and resulting actions.

Another key area included in the interview process is hermeneutics; the theory of interpretation (Smith et al. 2009). Hermeneutics builds on the idea that the interviewee brings a background to their story based on their unique experiences and interactions (Pringle, Drummond, McLafferty & Hendry, 2011). Therefore, it was vital to understand the interpretive nature of the interviewee’s dialog as well as the event they describe (Kluger & Nir, 2010). By understanding the events that shaped the interviewee’s past, one can better understand the developments that led to the change under review. Understanding the impact of grammatical and psychological valuations that the interviewer and interviewee brought to the table was vital to gain a clear picture of events (Schleiermacher & Bowie, 1998).

Guiding the hermeneutically focused questions in this research study were the goals to gain insight into the interviewee’s visible and hidden meanings behind their actions (Heidegger & Farin, 2011). In this focus, it was appropriate to consider the issue of a hermeneutic circle, to
ensure that the insight gained through an interview was understood in context and reexamination of the larger surrounding situation (Tuohy, Cooney, Dowling, Murphy, & Sixsmith, 2013). The methodology also included the opportunity for the participants to read and review their interview to ensure the correctness of the interview and any perceived interpretations. Recommendations for modifications from the interviewee were integrated into the final draft of the written summary (Wertz, 2005).

The ideal research design for this study was an Interpretative Phenomenological Analysis (IPA) approach to capture both the experiential and qualitative responses from the interviewees (Smith et al., 2009). IPA is comprised of three key ideas: phenomenology, hermeneutics, and idiography. Idiography is the focus on the particular, moving away from the general (Smith, 2015). In applying IPA, the research focuses on particular experiences for technological improvement at the college, this approach allowed the interviewee to concentrate on the identified situation in a focused manner allowing for a phenomenological reduction (Husserl, 2012) and by identifying the appropriate hermeneutics (Smith, 2015) the research sought to find experiences common to all interviewees.

Following IPA, the participants took time to reflect on the aspects of their selected experiences, through a semi-structured interview process. This approach allowed each interviewee to focus on the process and underlying relationships that allowed the technological innovation to be implemented at their institution (Cooper, Fleisher & Cotton, 2012). This qualitative focus directed the interviewees to make sense of the many pieces that allowed the change to occur on their campus (Smith et al., 2009). Throughout the interview, the researcher was conscious of the double hermeneutic phenomenon where the researcher maintains awareness that they did not live the experience as the interviewee (Larkin, Watts & Clifton, 2006).
Furthermore, the researcher maintained an empathetic and idiographic sensibility by examining each interview for commonalities and differences identifying the key minute details and common patterns of the interviewees (Smith et al., 2009).

It is the common themes among the diverse experiences of the interviewees that may isolate successful and detrimental approaches to achieving a technological change in the college. To ensure that a well-rounded view of each situation occurs, IPA looks at multiple angles for each experience (Larkin, Watts & Clifton, 2006) analyzing the interviews to gain insights into methods for ensuring technological innovation success at the community college level. It is the incorporation of Husserl’s (2012) phenomenological approach that reflects on a person’s individual experience which lead to insights linking the diverse experiences together (Smith et al., 2009).

In addition to IPA, consideration of the conceptual framework of top-down and bottom-up leadership styles allowed participation and interaction at various levels throughout the college environment to understand how changes are made (Kezar, 2012). Top-down leadership starts with the upper levels of management setting a decree to the lower levels they govern. Meanwhile, bottom-up leadership occurs with motivated individuals at the grassroots level (Kezar, 2012). Specifically, Kezar (2013) defined bottom-up initiatives as “those led by individuals not in positions of authority” (p. 762).

While watching for the top-down and bottom-up influences, the researcher also watched for the potential areas of concern among the DoI process (Rogers, 2003). The issue of potential pro-innovation bias was addressed by focusing the interview questions on both successful and unsuccessful projects involving technological innovations (Baumann & Martignoni, 2011). The individual-blame bias was addressed by ensuring the researcher kept an open mind and
interviewed by incorporating questions to probe the individual’s division including questioning individuals with varying levels of responsibility in the selected college while including the social unit as the unit of analysis (Ramseyer Winter, 2013).

The recall problem concern was examined by the researcher since the study remains within one institution and contains multiple interviewees discussing similar technological events which allows for a cross check of the data (Colby et al., 2012). The researcher strove to conduct the interviews within a narrow window to further reduce the recall bias concern (Rogers et al., 2015). To address the issue of equality in DoI, the researcher questioned a diverse representation of interviewees from the selected institution spanning income, ethnicity, age and duration working at the institution (Fokkema et al., 2013). Furthermore, the number of interviewees was less than ten, which allowed for a smaller data set and resulted in a rate of adoption of the innovation (Shimogawan et al., 2012).

Lastly the social system influence over the final adoption of a new innovation was a concern due to preexisting preferences and history (Ranjan, 2008). Within the social system, the opinion leaders of a social network are able to influence adoption among others in their group, particularly if the leaders are highly social (Cho et al., 2012). Those selected for interviews had prior experience initiating or being a member of an innovation on their campus and part of the interview questions focused on the consequences of their actions, one of the main areas of concern within the social system (Rogers, 2003).

**Site and Participants.** The individuals who were interviewed occupy a variety of leadership positions from faculty to administration in their respective community college environments. A small group of eight participants were identified who have shared in a similar situation of technological advancement at their college (Smith et al., 2009). These individuals
have guided advances in the technical curriculum offered at their campus including new program offerings. The interviewees were selected from one community college campus in the southern United States based on their participation in technological advances on campuses. Following the IPA approach, interviewees were asked to describe their own experiences where they gained success in achieving their technological improvement(s) on campus (Smith et al, 2009).

Positionality

In my career in higher education, there were often times when technological improvements were inhibited by current college practices and leadership. During my first year working at a public southern community college, I was an instructor in the area of technology; and I often found that I needed to devise alternatives and workarounds for many of the changes that I needed in order to provide an appropriate classroom environment for my students.

During my second year, I was promoted to Dean of Cyber Information Technology, a new division on campus with three full-time faculty that focused on offerings in networking, security, systems administration, cyber forensics, and programming. Over the following two years, the staff and faculty of the division identified many areas of improvement for the college offerings; and in the process, the division became nationally certified and recognized for those efforts. To work within the bounds of the college’s infrastructure, we frequently consulted the computer services department and the chief information officer (CIO) to consider solutions to teaching issues involving technology limitations of the campus.

Within two more years, the division more than doubled in size to include the computer information systems offerings with seven faculty, approximately 10 adjuncts and one staff member. This added more technology classrooms to the division and more discussions with computer services and upper administration for adapting classrooms to meet offering needs. This
rapid change to the computer infrastructure on campus began with the needs of each course offering and the inspiration of the course instructors. While many roadblocks were encountered along the way, there were also great accomplishments in working with other divisions across the campus to integrate and upgrade offerings.

The experiences gained during my time in higher education inspired me to pursue research to facilitate collaborations and encourage technology-focused improvements within the community college setting (Marshall & Rossman, 2010). With the knowledge of the college and colleagues who had experienced, in their mind, successful technological innovations, I selected to research individuals who were working at the public southern community college where I was previously employed. At the time, the college had 364 faculty and staff, 8,695 students enrolled, charging approximately $4,000 for in-state residents and offered 1307 degrees during the 2013 to 2014 academic year. I endeavored to gain trust among the interviewees through past positive experiences and focused on creating a social constructivist framework that allowed me to listen, understand and experience the environment of the technological modification (Creswell, 2013; Piantanida & Garmin, 2009). Through objectively undervaluing self-reflection, the benefit of “being there” was central to this approach (Biklin & Casella, 2007, p. 22) and allowed a unique perspective and level of comfort for the interviewees (Corbin & Strauss, 2008).

**Data Collection.** Each interviewee was asked the same set of open-ended questions in a semi-structured setting (Reid, Flowers & Larkin, 2005) to get an in-depth exploration of their perspectives of bottom-up technological leadership that had taken place at their community college (Smith et al., 2009). These questions focused on a qualitative and IPA approach to technological change that they participated and/or led at the college along with the relevant background experiences that allowed the change to occur (Smith et al., 2009). The interviewer
guided the questions to focus on the perspective of the interviewee’s experience and background while understanding the particular situation that occurred on their campus (Conrad & Barker, 2010).

Using IPA with interviews of individuals holding various leadership positions within community colleges, the research investigated the methods of effective change stemming from these various levels (Sadeghi & Pihie, 2013). These interviews gather the stories from the perspective of the individual about a technological change (Beuthin, 2014). The insights gained include their individual experiences, chronology of the experiences, individual perspective of the story, and context or setting (Creswell, 2012). Using this method, this study looked at one southern community college to identify common and distinct attributes of successful leadership style needed to improve technology at the community college level.

**Exploratory Questions.** In reflecting on the diversity found through all levels of the college environment, it was vital to consider the ramifications and be prepared for potentially unforeseen events. Technological enhancements can be one of the most costly aspects a college undertakes, therefore great consideration and planning take place to ensure that they are implemented for the benefit of the college. Inquiries that were used to guide the interview questions included:

1. Why do community colleges choose to modify their current technology?
2. Who is consulted and what method is used to evaluate the effectiveness of new technical systems before, during and after implementation?
3. What leadership has taken place to consider and implement technological changes?
4. How do you ensure that the chosen upgrades benefit the college and are implemented in the most advantageous manner, in line with the college mission and vision?
Each of these questions explored a different aspect that a college considers when reflecting on the current state of their technology and considering potential improvements. These different viewpoints were examined with a focus on the individual reflections required to implement a transitional technology (Biggerstaff & Thompson, 2008).

Participants were individuals employed at the selected community college in the position of faculty or lower administration. In addition, these individuals had participated in at least one successful and one unsatisfactory technological innovation on their campus. Following the recommendations of Smith, Flowers and Larkin (2009), eight interviewees were selected fitting the above criteria. The individuals were derived from the following subset of titles: Assistant Professor of English, Assistant Professor of Library Resources, Chief Information Officer, Dean of Technology, Engineering and Mathematics, Dean of Educational Technology, Instructional Technology Specialist, Program Director of Engineering, Program Director of Security, and Vice Chancellor for Academic Affairs. By looking at individual experience with a full understanding of the background of the interviewee, the IPA approach guided the empathic and factual reflection based on the interview questions listed in Appendix D.

Data Analysis. Each interview was recorded by an electronic device and focused on asking the questions outlined Appendix A. Based on the trend of the interviews, leading questions were used to elicit more detailed questions from the interviewer to ensure a complete understanding of each situation was gathered for analysis (Brocki & Wearden, 2006; Seidman, 2006). With the voice recorder aide, the interviewer took limited notes during the interview to ensure they were able to focus on the event at hand and direct the interview and clarify any points of concern.

Each interviewee was made aware that an electronic recording would be made of the interview. After the interview, each recording was transcribed and coded to assist in identifying
commonalities and differences between each interview (Miles, Huberman & Saldana, 2014).

Once the transcription occurred and the needed obfuscation of names for anonymity took place, the recordings were destroyed. Overarching themes from the data were identified by reflecting on how each interviewee interpreted their experience with technological change on their campus.

**Validity and Credibility**

When conducting qualitative research, the primary areas of concern for validity are credibility, criticality, integrity and authenticity (Creswell, 2013). Taking the first concern, credibility refers to the ability of the researcher to accurately interpret the information provided by the interviewee (Huma, 2014). Using the IPA method, the interviewer focused on each individual interview and consulted with the interviewee after the transcript has been created to ensure accuracy (Brocki & Wearden, 2006). By allowing the interviewee a review of the transcript, any needed corrections were made to ensure that there was not a transcription error or a misstatement of a situation recalled during the interview (Maxwell, 2005).

Addressing the second concern, criticality, there was a review of all data in both an individual and comprehensive manner (Augoustinos, 2013). This comparison of each interview to itself and each other allowed for a review of the gathered findings. This cross-analysis also ensured the ability to find common themes among the individual interviews. The third concern, integrity, identified the need for the researcher to remain self-critical and maintain awareness to limit bias (Joseph, 2014). Using the IPA method, there was a focus on identifying and explaining any possible biases on the part of the interviewee by asking detailed questions that delve deep into the goals and motivations behind the given actions (Smith et al., 2009).

Lastly, authenticity focuses on the need to identify the varying voices amongst those being interviewed (Bonner & Friedman, 2011). When working to find commonalities among the
distinct interviews, there was a focus to ensure representation between the differences in the participants’ experiences. By maintaining a reflection on the unique backgrounds of each interviewee, a more representative reflection was gained, validating the findings of the research.

**Protection of Human Subjects**

To ensure the protection of human subjects taking part in the research, the researcher followed the stated protocol for human subject research protection outlined by the Institutional Review Boards of Northeastern University and the institutions where the interviews are conducted. For the protection of those participating in the study, appropriate modifications to identifying information were made to ensure the safety of all those involved in the research project (Kaiser, 2009). Each participant was provided with a consent form before their interview and the form was reviewed with the interviewee before the formal questioning to ensure that the participants understood their rights.

If any concerns arose during or after the interview, the interviewee understood that they had the right to withdraw from the study. Maintaining a respect for the interviewees remained paramount throughout the study to ensure that all interactions adhered to the highest standard (Nolan & Vander Putten, 2007).

**Conclusion**

With the increased focus on a need for outreach and reliance on electronic technology at community colleges (Baran, Correia, & Thompson, 2013), the resources for teaching at these institutions have shifted to a more technical media (Ranjan, 2008). Technology has the ability to enhance, streamline and assist multiple areas of colleges. This research focused on the methods that assist implementing technology successfully to meet the needs of the institution (Rogers, 2003). One primary focus examined the various levels of leadership within the college starting
with a bottom-up approach of leadership (Kezar, 2008). Using IPA, the stories of multiple levels of leadership within one university were examined to identify approaches to implementing technological change.
Chapter Four: Findings and Analysis

The purpose of this study was to investigate the personal experiences of community college faculty and staff who have witnessed and been a part of technological changes on their campus. Six staff members and two instructors were interviewed, providing detailed accounts of their experiences integrating technology in the community college setting. Of the six staff members, five had either taught before or were currently teaching courses. Three super-ordinate themes emerged from the interviews, (1) strong institutional support is fundamental for ongoing technology review, enhancement and excellence, (2) a targeted approach is vital to rally campus support for implementing new technology and (3) concise research and workaround strategies are crucial for successful technological proposals and implementation. This chapter explores the findings in each of the super-ordinate themes along with common areas that emerged within each theme. Participant characteristics were presented first and summarized in Table 1, followed by the analysis section in which each theme is explained.

Participant Characteristics

Eight employees volunteered to participate in this study. Six of the participants were staff while two were full-time instructors. Of the six staff members, three were teaching at the institution during the current semester, two had taught at the institution previously, and one never formally taught. Each participant was interviewed one time for an average of 100 minutes. Due to the number of people in the study, a brief narrative providing some basic characteristics of each participant is provided.

Ana was the program director of engineering and prior to teaching at the Community College, she was mostly researching with some teaching responsibilities in biomedical engineering at a near by four-year university. She was a full-time teaching position and as the
program director, applied for and manages grants, organized the engineering advisory board, advised students and reviewed curriculum. She was in favor of technical changes that help simplify the duties of faculty and staff. She said that she enjoyed her position at the institution and did not plan to pursue any change in her role.

Bill was the program director of network security, a full professor and had been teaching in technology areas at the college for thirteen years. He was a full time instructor and as program director, applied for and managed grants, recruited for the program, organized the network security advisory board, advised students and reviewed curriculum. He reviewed industry trends and took advisory board recommendations to enhance current teaching offerings making sure that the topics are still relevant. He said that he enjoyed his position at the college especially interacting with the students and local businesses.

Colin was an adjunct instructor in technology and full-time campus academic advisor where he assisted students by reviewing transcripts and registering for classes. He started teaching at the college in 1987 in technology and was the division chair for six years. During that time, he saw large changes in technology being taught at the campus and used by faculty, staff and students. He said that he enjoyed his position and was very open to technological changes as long as it makes tasks easier or can help the students. Colin wanted to see the college adopt a computerized degree audit system to allow students, advisors, and faculty to quickly review and evaluate advisees.

Danielle was the director for the TAACCCT (Trade Adjustment Assistance Community College and Career Training) IV grant from the Department of Labor, which was offering advanced welding for credit and non-credit. Previously she taught English as an adjunct on campus and worked as the assistant director for the TAACCCT III grant. She described herself
as an early adopter of technology and pursued virtual training equipment to assist in the classroom. She said that she enjoyed the innovation that her position encouraged and wanted to see quicker adoption and more administrative encouragement of technological improvements on campus.

Grace was the campus systems librarian responsible for the library’s 200 computers, and ensured that the software available on the devices was current with classroom offerings. She served on the student technology fee committee. Before her current position, she was initially hired to create machine-readable records of all materials held in the library. She then became the testing coordinator for eight years, offering high stakes testing at the college. She said that she enjoyed her very adaptable role and worked with campus administration, instructors and students.

Larry was the campus’ Chief Information Officer, where he was responsible for the college’s information technology planning, operations, and policies. He arrived to the college on the brink of the Y2K crisis as the associate director of computer services due to his knowledge of the main software used at the college. He moved into the director position after the retirement of the prior director. Larry said that he supported any technical changes that the college needed or wanted including working closely with the system office. He said that he greatly enjoyed the implementation part of his role and not the politics. With a concern to the limitations of funding, he saw that his area was unable to “do anything that is technologically possible given the right amount of time, money and people.”

Peter was the Instructional Technology Specialist and administered the learning management software on campus. He also implemented any policy changes or new software plugins. Previously Peter worked at a four-year institution as the media director, where he
focused on video and migrated to computers with the changing technology. Peter used to conduct individual and group faculty training, but now handled technical problems associated with the changing additions of the learning management system. He said that he enjoyed his position and wished that his division of educational technology was better integrated into everyday operations at the college.

Victor was the assistant to the Dean of Educational Technology and then became the Dean, where he served on multiple campus technology committees. He was responsible for organizing face-to-face and online training for students and faculty on technology, and mostly focusing on the learning management system. As the assistant Dean, Victor taught full-time and adjunct faculty about creating courses using the learning management system and associated software. As Dean, he taught adjunct classes and provided insights on recent technology trends, course design features, and related software. He said that he greatly enjoyed his position with the focus on teaching and providing technological innovation for the best student experience.

One aspect that Victor wanted to improve was the method available for campus communication; while the campus had a daily email generated by Public Relations to condense relevant topics, it was not a very interactive platform.

Table 1

Participant Characteristics

<table>
<thead>
<tr>
<th>Name</th>
<th>Sex</th>
<th>Years in Academia</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ana</td>
<td>Female</td>
<td>9</td>
<td>Program Director Engineering</td>
</tr>
<tr>
<td>Bill</td>
<td>Male</td>
<td>13</td>
<td>Program Director Network Security</td>
</tr>
<tr>
<td>Colin</td>
<td>Male</td>
<td>28</td>
<td>Academic Advisor</td>
</tr>
<tr>
<td>Danielle</td>
<td>Male</td>
<td>3</td>
<td>TAACCCT* IV Grant Director</td>
</tr>
<tr>
<td>Grace</td>
<td>Female</td>
<td>18</td>
<td>Systems Librarian</td>
</tr>
<tr>
<td>Larry</td>
<td>Male</td>
<td>16</td>
<td>Chief Information Officer</td>
</tr>
<tr>
<td>Peter</td>
<td>Male</td>
<td>8</td>
<td>Instructional Technology Specialist</td>
</tr>
<tr>
<td>Victor</td>
<td>Male</td>
<td>8</td>
<td>Dean of Educational Technology</td>
</tr>
</tbody>
</table>

* Trade Adjustment Assistance Community College and Career Training (TAACCCT)
Themes

The three super-ordinate themes that emerged from the interviews are presented in the order in which they emerged. The first super-ordinate theme was the importance of strong institutional support for ongoing technology review enhancement and excellence. In this theme associated subthemes are presented. These subthemes include how the participants described the importance of a college mission and vision that supports technology, need of a technologically inclusive strategic plan that includes clear processes and procedures for reviewing and supporting new technological enhancements, and the value of implementing progressive technology for teaching and learning excellence.

The importance of a targeted approach when rallying campus support for implementing technological ideas was the second super-ordinate theme. The associated subthemes for this super-ordinate theme include how the participants discussed the importance of understanding and working with the key issues for campus administrators, the need to tailor their approach to gain the support of key faculty and staff, the importance of understanding and working with the campus CIO, and strategies that they found successful.

The third super-ordinate theme that surfaced when talking with the participants was the importance of thorough research and consideration of workarounds when proposing a technological change. In this super-ordinate theme, the subthemes include how participants identified key methods to facilitate acceptance of a technological change, characteristics of a successful technological change, and characteristics of an unsuccessful technological change while considering workarounds.
Each one of the super-ordinate themes contains a subtheme. Figure 3 includes a summary of the layout for the next section. In the following section, each super-ordinate theme and subtheme is discussed along with the perspectives of the interviewees.

*Figure 3. Super-ordinate themes and subthemes*

| Strong Institutional Support is Fundamental for Ongoing Technology Review, Enhancement and Excellence |
| • Mission and Vision Statements That Support Technology |
| • Strategic Plan That Contains Clear Processes and Procedures for Review and Enhancement of Technology |
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**Strong Institutional Support is Fundamental for Ongoing Technology Review, Enhancement, and Excellence.** Overall, the participants lacked familiarity and knowledge of the college’s mission and vision statement, however, there was a strong sense of cohesive direction given by the college’s upper administration on the technological initiatives supported by the college. Both in the projects supported and pursued by administration and the changes that occurred on campus, the majority of the interviewees said that technology was vital to the college’s survival in a more electronically connected world. Unfortunately, the strategic plan for the institution did not clearly state a technological objective. The interviewees said that the college did not plan for technological change and it was up to each individual college personnel
to pursue funding and initiatives to implement the campus’ unspoken mission to adapt to technical change. Fortunately, this southern community college provided an internal mechanism to grant faculty and staff limited funds to implement technical innovation on campus. In addition, the college had a robust grant office that assisted personnel in submitting local, state and national grants. While there were mixed concerns about the impact and structure of technology in teaching, there was consensus between the interviewees’ that students today expected technology in the college they choose to attend.

**Mission and Vision Statements That Support Technology.** None of the eight participants were able to state the mission statement of the college or show a complete understanding of the current statement. Only Larry, the CIO for the college, discussed the mission statement’s lack of reference to technology when he outlined his personal goal to assist with the future revision of the college’s mission statement. The mission of the college, posted on their campus website, provided indirect references to the use of technology through the aspect of “innovative delivery” of courses and an environment that provides students with skills to work in a “technological society.”

The mission … is to promote attainment of educational goals within the community and strengthen the regional economy. This mission is accomplished through the innovative delivery of quality courses and programs that provide sound academic education, broad vocational and career training, continuing education, and varied community services. The College provides a wholesome, ethical, and intellectually stimulating environment in which students develop their academic and vocational skills to compete in a technological society. Furthermore, the vision statement of the college posted online was “Excellence in education and service.”
Reflecting on a technological vision, neither faculty members, the systems librarian nor the Learning Management System (LMS) administrator stated that there was a specific technology-focused vision statement at the college nor was there one posted online. Yet, Colin and Danielle both said that there was a general technological vision supported by the college administration. Victor further refined this focus and saw the campus technology vision as a new directive that the college must offer more degree programs online. Only Larry identified a clear vision that “originates from top down, our system office that presents certain visions, it filters through the Chancellor who adds to those visions or refocuses those visions and the visions from my department are from me.”

The most junior faculty member, Ana, stated that she “didn’t look at the mission statement” but commented on a recent learning management system change: “as faculty we do see some technology change, like, for example, the teaching tool going form Blackboard to Canvas.” Another junior staff member, Danielle stated, “I think that we do address technology in the mission, at least in the vision statement it is addressed.” Meanwhile, the more senior faculty member, Bill, stated that technology “had not become an overall mission at our college.” From the perspective of the CIO, it was the changing technology and the requirements of different accredited degree programs that forced new technological requirements on the college and faculty. This infusion of technology in curriculum was discussed by both of the interviewed faculty members and the Educational Technology staff members. Victor spoke to one example of technology forcing an adaptation in teaching methods and subsequently the college

Technology, I wouldn’t say it shapes the mission, the mission shapes the technology. For instance, in nursing, particularly in that area, the data and the way that people learn has changed and technology is assisting those people, particularly the younger people who
grew up with technology, and the college delivers what they expect in technology so things are progressing towards those types of people who grew up with technology. So the college is adapting to that environment, as it is needed.

Likewise, Victor identified technical innovations in teaching employed by the faculty. These varying methods, used to reach the diverse students that attend campus classes, were discussed as online, flipped and hybrid classes that include compressed video for an inclusive distance-learning offering.

Bill stated that it was a division or area of the college that drove technological change, which caused a grass roots enhancement. Working in the Division of Technology, Engineering and Mathematics, he said, “I think that it has been more within our division and I feel that we have support from the campus, but I don’t feel that it has been an overreaching mission statement for the campus.” Yet, from the perspective of the CIO, Larry saw beyond the specific wording that “part of the mission is being able to adapt.” Danielle stated her viewpoint based on the programs supported by the college,

We do like to consider ourselves innovative and on the cutting edge of the next program that comes along. So I think to some degree we do want to be technologically motivated. There are certain pockets of innovation where the college has tried to use technology to be forward thinking.

Looking directly at the lack of reference to technological support of teaching in the mission statement, Peter, who administered the learning management system used by every class offered on campus, stated his concern about the mission statement.

I think this is part of the problem that we are having right now. We have not identified technology as part of the mission as far as I know right now. And so, I think that is part of
our problem. I don’t know how else to answer that because when they talk mission, they talk electronic, but I do believe that we are an answer to a lot of problems to answer the goals.

Going further, Peter discussed the differences in the way that campus faculty and the division of Educational Technology saw solutions to the current problems that the college faces.

It came up last Monday, a week ago today, the Chancellor had a meeting with all of us in the theatre, and the state’s 2020 goal is to double enrollment. And the question came up from the instructors right away, ‘where are we building more parking lots and buildings at?’ And we are like, ‘you don’t have to do that. You just need to re-look at the way that you deliver courses. If it is a lecture type thing, we can handle that for you, if it is a lab type thing, then you need to be building more labs. But you may need to be converting lecture rooms into lab rooms and deliver lecture a different way.’ So we see ourselves as a really good way to support the goals of the school, yet, even at the Chancellor’s level, when they talk about goals that way, they don’t talk about us. That is frustrating.

Bill added to this discussion from the perspective of a network security instructor when looking at the college’s current focus on technological improvements within the institution and how the college’s stance impacts the way that students are able to interact in the classroom.

Just looking at the infrastructure that we have in place. We don’t see a lot of improvements to our wireless connectivity, which the students would like, so I really feel that if the campus’ mission as a whole was more technology focused, we would see the increase in wireless connectivity. We would see the increase of having students say, hey, we need to have laptops coming into the classroom. And bring the technology into the class. I don’t feel that the overall mission of the campus supports this.
Speaking from a historical perspective, Colin shared the technical changes that have happened throughout the college for faculty, staff and students.

As the college grew in size we saw the need to implement new technology, as it became available, both in the administrative duties of running the school and in the demands of the students with the every changing and ever growing technologies. We have grown so much, from using word processors, having only two computer labs on the whole campus, and having limited computers for the staff offices to now almost every department has its own computer lab and we have some of the area’s leading programs in technology, in particular in the area of cyber technology.

With all of the changes that occurred, the need for training faculty and staff in new technology increased. Ana stated that the Educational Technology department “offers pretty good, pretty complete, pretty hands on workshop and training and they answer questions pretty competently.”

**Strategic Plan That Contains Clear Processes and Procedures for Review and Enhancement of Technology.** Mirroring the vague responses about a campus technology vision, there was also a lack of continuity among the responses of the interviewees’ reflection of technology within the college’s strategic plan. Neither of the faculty nor the educational technology staff were aware of any technology inclusion in the strategic plan. Victor summarized the overall thoughts

I do know that there are documents that talk about how we are using technology and how we are incorporating it in the future. But as far as a strategic plan, in the sense that there is a strategic plan for other areas, I really do not think that there is one.
Furthermore, Peter discussed his concerns about the differences in technology vision between someone who understands technology in depth and someone who uses applications on technical devices.

I think that we keep talking about it, but until we get it on paper, until administration starts looking at it this way, I don’t think that it is there yet. When you say technology-focused plan, I think they are like, yeah, our computers work, we can use Word, we can print.

Underlying Peter’s statement was the concern that administration at the college sees technology on a very superficial level, which doesn’t allow the college to provide long term planning for technological changes. Peter stated that his division was under appreciated by comparing his area to that of a “parking lot.” He stated that there was a lack of understanding of what his division does and therefore a lack of inclusion in the college planning process.

If I need to park there, I will use you. If I don’t need to park there, I don’t need to use you. Where we look at ourselves more as a classroom, part of the delivery, that we are a part of each classroom. And at different levels we should be a part of that vision and that strategic plan.

Victor commiserated with this concern by stating

When my division comes up with the idea, then we have to pass it through an electronic learning committee made up of faculty and staff across campus who are not necessarily associated with technology they are just various instructors and staff people.

By having individuals on committees ruling on areas that they are not familiar with, there was a concern raised by both Peter and Victor to the efficiency and effectiveness of enhancing technology on campus.
Both Colin and Danielle stated that there was not a specific mention about a technological imperative, but there was support through the technology fees offered on campus to support the strategic plan. Colin provided a historical reference for the creation of the campus student technology fees overseen by the students and stated that these course fees allowed the college to “get the funds needed to purchase the equipment that helped to insure that the students met the requirements for employment.”

As stated in the online reference for the college, the purpose of the student technology fee was “dedicated to the acquisition, installation, maintenance, and efficient use of the state-of-the-art technology solely for supporting and improving student life and learning and for preparing students for living and working in the twenty-first century.” Faculty and staff were allowed to submit proposals to this fund at the beginning of the spring and fall terms. The technology fee application was required to align with one of the three strategic goals and associated objectives. Furthermore, the limitation in the amount of grant funding distributed each year was based on the amount of income that is brought in by the fee each semester. The Student Government Association kept active members on the funding committee to determine which proposals should receive support that cycle. Larry stated his role in the technology fee application process as reviewing “to determine if there are compatibility issues or some other obstacle that may prevent a successful implementation.” He stated a very open-minded perspective when reviewing the technology proposals:

Even if I don’t like it, if it is something that is possible, I will stand behind it, even though I don’t like it. I don’t want to be the Nazi of technology. If it is something that makes sense for somebody and it gets the majority votes, then we will make it happen.
In addition to students, computer services, faculty and Deans also sat on the funding committee to give a broad perspective when reviewing proposals. Both Grace and Larry referenced the importance of computer services to provide the technology vision for campus, but Grace equated the vision to maintenance concerns

That would be computer services. They try to make sure that the equipment that we have is under warranty and up to date. They recommend when equipment needs to be replaced.

Larry, the CIO, stated that the current strategic plan is “a little bit dated.” The plan posted online covered the years from 2014 to 2019 listing two goals, three objectives and 23 strategies. One strategy in the strategic plan was focused on technology; this goal and objective centered on increasing the number of students who attending the college. The associated strategy focused on increasing the opportunities for electronic learning statewide. While this tenuous link to technology focused on one instructional delivery method, there was no reference in the strategic plan toward improving technology in the facilities on campus for students, faculty and staff. To address these concerns, Larry mentioned that he is “a member of the statewide IT group that is forging a comprehensive strategic technology plan that should help everybody out. Because our focus is with the system, we want to have a plan that would apply to most of the community and technical colleges.”

Building on the student technology fees, the interviewees gave mixed feedback in understanding the funding that was available to support technological innovation. As the most junior faculty member, Ana, identified external sources of grant funding and stated a preference for either pursuing these methods or imposing a technology fee on her course so that the students could fund any small technological needs for the class. This aligned with Ana’s familiarity with
state grants like the Board or Regents and national grants like the Department of Labor and National Science Foundation that she pursued and was still obtaining through her previous research at a four-year institution. Similarly, Peter identified the same types of funding opportunities while Victor, as a current Dean, and Colin as a former Dean, added the division budget source.

Bill, a senior technology faculty member, preferred to get technology ideas from attending conferences and personal research before pursuing the campus funding opportunities through the technology fees. He received funding in collaboration with a consortium on a national grant and has applied for and received funding from state Board of Regents grants. This was similar to Grace, who served on the technology fee committee in the past and received its funding to enhance the library from multiple submissions. Likewise, as a key member of the technology fee proposal process, Larry had only sought funding from the on campus opportunities. While Danielle was currently being funded through a national Department of Labor grant housed on campus, she also recognized the technology fee and was the only interviewee to discuss the opportunity provided in gifts to the college foundation.

Colin preferred to work within his advising area when proposing new technological ideas that may or may not cost money. He gave a detailed example of a recent procedure that he followed to implement a program that would generate a monthly report of the number of unduplicated students who visited the advising center.

When we only had a couple hundred people, I could go in and sort them alphabetically and then physically go through the list of all students to delete the ones that were repeated. After several months of adding the students to the bottom of the list and I was having to sort and go through the 3,000 or 4,000 names, the process was taking longer and longer
to complete. I did a research and found that in Excel, I could download a power query package which would allow me to complete the task a lot quicker. After discussing the solution with our Computer Services Department, I went to my supervisor and requested to have an upgrade added to my computer. My supervisor approved the upgrade and Computer Services installed the program. Now I take my old list and add the new students to the bottom of it, then I go into the power query and import the list and from there I run a command to get rid of the duplicates. About 10 seconds later all of the duplicates are gone. A process that before required no less than an hour can now be completed within a minute.

Overall there was a wide breadth of sources for funding technological projects, with each interviewee clearly stating their preference for specific methods based on their prior experience and successes. These preferences outlined the procedural differences made aware based on each position and the historical preference of the employee.

**Progressive Technology That is Valued and Implemented for Teaching and Learning Excellence.** There was a clear preference from the interviewed instructors and educational technology staff that technology should take a paramount role in the classroom. Ana stated that it was the responsibility of the instructor to ensure that technology was embedded in lessons so that students were “aware of what is out there” whether this meant they experienced the technology in the classroom or were exposed to the tools and gained the knowledge to remain competitive in today’s technology driven engineering environment. Bill echoed the same thought stating that “we are totally surrounded by technology” everyday from our cell phones to the cars we drive. From his perspective, as a network security instructor, acknowledging that
technology is a part of our daily lives was inescapable and he wanted his students to be marketable with up-to-date technical know-how.

Both Peter and Victor expressed concern that upper administration does not appreciate and understand the importance of ensuring classrooms used technical tools. Their concern stemmed from an observation that students today appeared glued to their cell phones checking social media sites and responding rapidly to various forms of electronic correspondence. Peter was concerned that “technology [for online courses] had always been looked at in higher education as a separate thing” following with an example of the college’s computer services area blocking YouTube videos because they said that “there is nothing educational on YouTube.” Peter said that the ability of a non-educationally focused division dictating the availability of electronic resources to the faculty stemmed from the administration’s lack of understanding that “every class needs to have an electronic portion” to meet the demands of today’s technically savvy students who, as Victor stated, “are not going to live life without it.” Furthermore, Victor affirmed that students shop around before enrolling in a college, and to survive in a competitive higher education market, a college “can’t just be involved in technology; we have to be very good at it.”

Danielle echoed Peter’s comments about the generational focus on technology. Peter stated that the “only way to connect students is electronically” since “technology is now the students extra finger; it is just a part of them.” There was concern from Danielle that colleges were often behind in understanding and using new technology since students often “know more about it then [college personnel] do.”

Focusing more on pedagogical demands, Colin and Grace discussed the importance of using technology as one of the many tools in an instructor’s toolkit. Colin focused on the idea
that technology should be used “as long as it is helpful” and that there should be a strong
evaluation between current non-technical tools as well as technical tools to ensure that students
understand the underlying logic before using “technology as a tool for timesaving and effort
saving device.” Grace narrowed in on the need for instructors to include “multiple teaching
styles” in the classroom to ensure that every student’s unique learning style was fostered. In this
case, Grace identified technology as a tool that had the potential to aide in helping teachers reach
all students in their classroom. In her opinion, technology was a “good tool and [she] can’t think
of any classes that wouldn’t benefit” in incorporating computers to help students see another
perspective.

One view distinct from the other interviewees came from Larry. As CIO of the college
he stated that some “technologies don’t have any business in a teaching environments” and that
there was too much use of computer labs in the classroom. While Larry supported the use of
smart boards and technology that allows interactive presentation, in his view, computer labs
often removed pedagogy from the classroom.

I am seeing too much use of computer labs. These people come here and they are placed
into a room. They log onto a program and follow the first link on the page and sit here
for an hour and do that. There is no need to come to campus and do that. And I see
faculty who are using technology and it is taking them away from the role of a teacher. I
think that is a shame.

When the interviewees were asked about methods that were used to encourage progressive
technology in college personnel, there were mixed views. Bill said that there was no
encouragement except from the students themselves and their responses and actions in the
classroom. Ana and Victor gave examples of a “culture shift” created by outside influences that
indirectly guided faculty and staff through student evaluations, advisory board meetings and general observations of increased technology use by peers. Along a similar vein, Larry said that there was no need for administration to communicate the importance of technology on campus, as the changes were obvious. Similarly, Grace discussed her perception of an innate desire for campus personnel to remain up-to-date with changing technology, seeking methods to ensure inclusion in the classroom. Danielle discussed the concern and difficulties for spreading awareness of and the availability of technology tools for instructors.

Meanwhile, Colin and Peter discussed the need to remain with traditional teaching methods. In Colin’s opinion, there were some topics, like mathematics, that should have only limited interaction with technology. Colin stated that the “technology [should be] used to have the student either test himself or herself on the material or review what they have learned” and he encouraged using technology to help students review subject matter before exams. Building on this idea, Peter stated concern that strong student demand for increased technology was leading instructors to change their methods. He said that this pressure was making faculty reach beyond the methods that were used when they were in college and create new pedagogical strategies. Unfortunately, this time-intensive endeavor was a struggle as faculty at the college have not received raises in several years and said that they are overworked.

**A Targeted Approach is Vital to Rally Campus Support for Implementing New Technology.** When pursuing a technological change within a college campus, the participants discussed many vital factors including people and infrastructure. Several participants stated that it was very important that one have a clear understanding of the pressures and demands of supervisors and upper administration. Furthermore, the interviewees discussed areas of concern when their proposed change was in conflict with or did not support the current endeavors of
administration. It was also recommended that one type of research beyond the technical change was to consider potential funding options to support the proposed endeavor.

When approaching larger plans that require faculty and staff to be trained, the interviewed staff recommended a delicate and gradual implementation. This was particularly discussed among both interviewed faculty and staff when they discussed plans to meet with the CIO for larger infrastructure changes. Several interviewees recommended using a reward system when working with computer services to ensure future goodwill with the hard-working area. Overall there was a consensus among the participants that a procedure of good research, both on and off campus, along with updating supervisors of potential changes, provided a good foundation for approaching technological change on a college campus.

**Paramount Issues of Key Administration.** One of the key ideas that the interviewees expressed was their need to clearly understand the pressures of their immediate supervisor and the direction of the college. In reflecting on their immediate supervisor, all of the interviewees acknowledged that their bosses did not have extensive technical knowledge. Therefore, it was vital when discussing recommendations for technological changes that they explained how the change would impact the college.

Victor clarified that his supervisor made “it very clear to me that she has hired me for a reason and that reason is to learn and implement appropriate technology for our school.” Therefore, it was important to provide brief details in the technical nature of the requested change. Bill expressed concerns about his supervisors’ lack of understanding of technical requests, and her potential to “get snowed under by people” when she only “relies on our expertise for what we need and why.” All but one of the interviewees expressed gratitude toward the openness of their supervisor’s willingness to listen to new ideas and consider policy
and available resources before responding to a technical request. The lone exception was Larry whose supervisor was also over the financial division of the college. Larry stated that his boss required a clear and significant benefit before considering technological improvements.

When considering the technical issues that are most important to administration, there were mixed interpretations. From a teaching perspective, Ana said that the course management software specific to the needs of each subject area of the college was of paramount concern, especially considering the technological features that were marketed from textbook publishers. From a staff perspective, both Colin and Larry agreed that funding and realistic understanding of the budget was a paramount concern to their administrators. In addition, Grace echoed Larry’s focus on the importance of college position in relation to other system colleges. In particular, Grace discussed the centralized systems combining college functions like payroll and library resources while Larry highlighted the importance of peer institution ranking.

Danielle, Peter and Victor discussed administrative concerns about constantly increasing enrollment. For Danielle the focus on enrollment centered around finding funds for activities promoting student success while Victor provided a Dean’s perspective by speaking to the data mining available on course performance and graduation statistics. In examining the underlying reasons that administration focus on the identified issues, Peter and Victor identified a state initiative that required the college to double enrollment and tie student performance and job placement after college to state funding guidelines. Along the same vein, Larry stressed the process resulting from a state funding formula that creates competition among institutions of higher education.

As a result of fiscal pressures, Ana stated that the campus was run more like a corporation rather than a college. Danielle, Larry and Victor focused on the need for constantly
increasing enrollment to provide the college funding through tuition and the state funding formula. Peter stated, “we are now mostly funded upon money that we bring in. Survival is getting a student in here, finding out how they want to receive education and getting it to them.” To attract students, Larry said that college administrators “want high visibility, mobile, the pretty stuff that can compare our college with a nearby four-year.” With a mind to the changing upper administration of the college, Colin reflected that

In the past we had a Chancellor who was not so technologically oriented and when technology advances were requested campus wide, he would always check and double check. If you went to him and wanted to get some new technology, you had to explain the technology to him in detail. And if he saw the need, he would approve it. If he did not understand it, he would deny it. Our previous Chancellor was more up to date on social media and other forms of technology and was more likely to understand and approve the implementation of new technology. Understanding the implications of using new technology is the key to getting any administration to implement changes.

When reflecting on methods to approach administration, Colin and Larry again narrowed in on the need to identify appropriate funding streams before approaching administration with any idea that needs monetary support. Meanwhile the faculty, Ana and Bill, approached their Dean by identifying the benefit to their area supported by recommendations of advisory board members and clear technology trends. They tailored their proposals to the technical knowledge of their leadership. Two of the staff, Grace and Victor, preferred to approach their supervisor with a clear plan in writing that outlined the key points of their technological recommendations.

**Support of Key Faculty and Staff.** Overall, the interviewees all said that the approaches needed to train faculty and staff were similar for training but different when presenting the idea
of new technology. Reflecting on training, Danielle mentioned “it is a little bit easier if you can get staff on board first and they can help alleviate the concerns of the faculty.” She also expressed a concern that “faculty see [change] as more work to do and so do the Deans. They already have so much work to do already. So they are very resistant because any kind of change, they just see as more work to do.”

Ana mentioned the importance of making sure that faculty and staff understand how the new technology can benefit the students. In the case of faculty, Ana said that it was vital to focus on the teaching aspect and how their pedagogical methods may be impacted. Meanwhile the staff focused on more business aspects of the college. Victor also discussed these different domains, and encouraged training the two groups separately so that they can “really personalize the training for their role.”

When looking at methods of training faculty and staff, Bill mentioned that more interactive sessions, which allowed for trainees to “look at it and touch it.” He found that this approach helped increase the understanding of all participants. Colin echoed this idea and said that he enjoyed working individually with trainees to demonstrate and convince them of the benefits of the new technology. Colin stated that if you started with “here is a new technology, you have got to use it”, he would often find opposition to the technology solely based on the heavy-handed approach that was used. Meanwhile, Larry preferred that “faculty and staff to be [his] guinea pigs before [computer services makes] an across the board rollout” to ensure that there would be a smooth transition to the rest of the college employees. Larry said that he worked to ensure that the classrooms maintained the cutting edge software and equipment.

In educational technology, Peter discussed the two approaches that their area had found successful: “we can save you time and effort” and “we are trying to increase the value of what
we are doing.” Overall, Peter said that there was little difference between the training given to faculty and staff, but their approach was very important, one that introduced any new idea “very slowly.” Colin said that one important aspect of any training was to ensure the focus of helping the student remains paramount. For faculty, that assistance focused on classroom and pedagogy. Meanwhile for staff, student assistance may have allowed quicker access to student information and guidance.

As head of technology training, Victor began all available training opportunities by posting a training announcement. Similarly, Grace said that the library had a liaison with each department who checked in with their assigned area each semester to ensure all needs were being met.

Yet there was concern expressed by all interviewees about individuals who are resistant to any technological change. Ana stated that there are “people who have an internal wall built up, they just feel that they are being asked to do something hard, ‘I don’t want to learn, I don’t want to do it’.” Peter echoed this sentiment saying that the word “change” was considered negative, so his area used the term “improvements” for all training so that the initial perspectives were more positive to learning new information. Victor also identified a difference beyond the two positions at an institution stating that “the younger, fresh out of college, or brand new to teaching group adopts it well, they even expect it to change often. The more traditional instructors are more hesitant.”

Meanwhile, Ana stated that faculty more involved in technology were more likely to embrace technological enhancements, seeing it as a method to help improve their teaching. Reflecting on the historical changes, Colin mentioned that faculty and staff today embraced change quicker than those of 20 years ago. Danielle recommended identifying key individuals to
be key early adopters who could help spread the word about the benefits of the technological change and encourage a quicker buy-in. Another approach recommended by Grace was to make sure that one’s training was as easy as possible for the trainees and that you “capture their imaginations.”

**CIO Concerns and Limitations.** Not all of the interviewees have had the opportunity to work with the CIO, but all worked with the computer services area under the direction of the CIO. For those that worked with the CIO, there was a strong concern that their that interactions with the CIO tended to be negative and there was a preference for the CIO to interact only with staff members. Bill stated that the CIO did not like new ideas and preferred to stay at status quo. Danielle mentioned that he “doesn’t have any involvement with new technology” while Grace stated that when a new technological idea comes up, “he pretty much lets his staff handle” the implementation details. Victor commented that the CIO “delegates well.” Peter added that his area receives “a lot of push back from” computer services. When he does have to confront the CIO, he preferred to have a one-on-one discussion and slowly introduce a new idea. Looking at the wider scale, Victor stated that the CIO tended to be cautious about any new idea and “from colleagues around the state, [he] understands that this is a common response from CIOs and so [he] figures that it must be for a good reason.” Peter gave his perspective that computer services was “really interested in security” and focused on maintaining a strong firewall to protect the college infrastructure, students and personnel from any cyber attack.

Overall, the interviewees each stated that they strategized before any meeting with the CIO, and preferred to work with the computer services staff or Senior Systems analyst before meeting with the CIO. Bill stated that there were times when “we can manage it and we can take care of it.” He preferred to keep the CIO updated on changes that occurred and as Grace stated,
he tried to “keep our requests to a minimum.” When Peter needed to have computer services implement a new technology, he researched to “convince them that someone else is doing this and not that we came up with this idea on our own that gets it out there.” Unfortunately in situations where they were blazing a new path, contact with the Chancellor was needed to increase the pressure and ensure that the update went through. Likewise, Victor made sure to “get the feeling of administration on an issue before” heading into a meeting with the CIO.

One method of working with the computer services area involved a reward system. In Danielle’s case, when she applied for a new grant, she makes sure that she added funding in to increase the infrastructure for computer technology on campus. More directly, Bill’s area invited the computer services staff to any training opportunities that they organized so that computer services staff “can see that we do want to work with them and collaborate on things.” As a thank you after working with the computer services area, Grace’s area provided a pizza party reward.

All of the interviewees discussed the importance of long term planning with the computer services area. Bill said that he makes sure to “Give them a heads up. Include them in the process.” When there was opportunity for flexibility, Bill preferred to ask the computer services staff for their recommendation on new equipment for infrastructure, allowing their area to have more ownership in upcoming changes. Danielle stated that she made sure to avoid emergencies and involved computer services in any upcoming grant planning when their area would be impacted. Similarly, Grace echoed her preference to make computer services part of the planning process even when it would be several years before the completion of a planned technological change. In summary Victor stated his approach

I avoid impromptu meetings with them. I avoid stopping by to chat. I avoid dropping ideas casually on them; just walking around campus or something. I try to remain very
structured, non-purpose when I talk with them. So I avoid surprises and I will never talk
with the CIO without thoroughly thinking it through first. Avoid un-preparation.

**Successful Implementation Strategies.** Overall, the interviewees all had a similar
starting place for any new technological implementation: research. Research recommendations
consisted of student surveys to ensure need, industry research through advisory board contact,
conference meetings and online tools. Next one would identify any issues that may arise,
problems that have or could occur and pursue internal buy-in, and vet the idea with fellow
colleagues. Once extensive research was conducted, one could pursue funding opportunities that
would vary based on the size and type of project. After funding has been identified, one would
approach supervisors and administration to discuss validity of the project and pursue supported
paths.

In addition, there were some key features that the interviewees stated would make any
pursuit of new technological change smoother. Ana mentioned the need for open
communication and a supportive supervisor to help guide faculty attempting to implement
change on campus. Bill stressed the need for adequate planning time before pursuing a new
project to allow the potential unearthing of issues and concerns. Danielle stressed the need to
consider delays caused by existing campus procedures; of note she mentioned delays in
purchasing and human resources encouraging considering paths that allowed technical changes
to remain within her division, where implementation procedures were more streamlined. Grace
wanted to see stronger interdivision communications that allowed for sharing of ideas to avoid
reinventing the wheel. Similarly, Victor desired smoother campus communication methods to
encourage and pursue sharing of successful ideas. On a slightly different vein, Larry discussed
making use of off campus resources such as cloud computing and encouraged stronger relationships with the systems office as more systems become integrated across the state schools.

When asking about the ideal process for implementing technology on campus, Ana took a unique approach and cited an efficiency strategy from General Motors (GM). The premise of the idea is that any employee in a GM plant can submit an idea and if their vision was implemented, they could earn up to $15,000. In Ana’s mind, this would create a campus that embraces change by valuing ideas from all employees and rewarding either monetarily or verbally for their inventive improvements.

Victor and Bill took a more direct view that the ideal campus process would proceed by identifying a need, conducting individual research, testing the water with colleagues, gaining the support of supervisors, pursuing funding, and implementing. Victor also added the need for strong support of all technological changes throughout their entire process.

Colin summarized his ideal process with one word, “cooperation” saying that at all levels, for a plan to be successful, all parties involved must cooperate and work together. Danielle chimed in by stating that divisions needed to be empowered to pursue technological change within their domain while Grace took it to a larger level by idealizing a campus committee representative by all divisions on campus and all levels within the college. Building at a larger level, Peter said that he would like to see technology as a more visible part of the campus planning. In Victor’s words, this included “an administration that understands the true need and value of technology.”

Concise Research and Workaround Strategies are Crucial for Successful Technological Proposals and Implementations. Each of the interviewees was selected because they participated in a technological change at their institution and had been working there for
over one year. Reflecting on a successful technological change, the interviewees identified three key features that they found assist in helping to ensure a technical projects success: research, positive attitude and an example that relates to the intended audience. Furthermore, the interviewees were able to walk through an example of a successful change that they have been a part of to discuss the varying approaches tailored for each situation and discussed why the change was able to succeed. Likewise, each interviewee gave an example of an unsuccessful technical change. The open and honest reflections help to frame scenarios where a desired change was not successful. Lastly, an implementation of potential workarounds is discussed.

**Key Methods to Facilitate Acceptance of a Technological Change.** When looking at approaches to encourage community college members to accept and use a new technical change, the interviewees’ focused on three main ideas: research, positive attitude and starting with an example that directly applied to your audience members. Ana, Bill and Danielle all stated that they start any potential technological change with strong research to identify any potential areas of concern and find related comparisons used at other community colleges. Bill mentioned his openness to accept potential new ideas from anyone, including colleagues, conferences or students in his classroom.

The second approach identified by Danielle and Grace was to maintain a positive attitude. Joined with an “overly optimistic” demeanor, Danielle said that the fears of many new users could be allayed. Colin stated that there was a particular phrase that he preferred to use to start any presentation with new technology, “Let me show you something that I think that we can all use.” The last approach focused on finding faculty members that had already used the product to report the instructor’s success at the start of the presentation.
In some cases, Peter mentioned that he had to go out and find faculty members willing to test new technology so that he could use their experience as an example during his presentation. Victor mentioned “if I can find somebody who is doing it, doing it well, with proven results, then I will show it to our faculty and usually they will adopt it with open arms. Usually.” Peter, Larry and Victor all stressed the importance of taking it slow when presenting new material so that no one gets lost.

When looking at the methods to avoid when introducing a new technology, each of the interviewees was partial to a different concern. Bill and Grace preferred to gradually introduce an idea and make it appear like it was the other person’s idea. In Bill’s words

Why do I need ownership of it. So if I know this one particular person will respond better if they feel like they were being more of the suggesting party instead of being told what to do, play it that way. Playing it that way makes it more easily accepted across the board with certain people

Colin stated that he tries to make sure that he does not put the other person on the defensive when teaching a new technology. Grace and Danielle mentioned that there are some individuals who refuse to accept change, by being aware of those personalities; she says that you can target those who are more likely to accept change.

Peter, Larry and Victor all agreed that making something required or mandatory was a sure way to kill any new project. In Peter’s words “So, if we want it to die, we just say, you have to do it, suck it up, and it will die.” Victor mentioned that it was important to prove that a new technology works to each person that has to adopt the new system.

Successful Technological Change Characteristics. Each of the interviewees were asked to give an example of a successful technological implementation project that they were a part of
and to describe what made that project prosper. Ana, Grace, Peter, Larry and Victor all mentioned examples involving software that helped enhance a process that was already in place. Ana discussed a software package developed by a local four-year university being piloted at her community college for the second year. While there were features needing enhancement, the type of questions that were provided by the home-grown problem generator were ideally suited to help prepare students to take a national exam. By being able to have input in the type of questions that are added to the database, she was comfortable using the system and planned to continue using it.

Also focusing on a grant opportunity, Bill discussed a National Science Foundation opportunity to implement cyber programs and training. In his view, the benefits of training and curriculum updates were monumental in being able to get his campus’ computer technology courses updated. In addition, the contacts that he made in training with other fellow instructors had been greatly beneficial allowing continuing collaborations beyond the life of the grant.

Grace mentioned the transition from paper to electronic databases stored in library systems. During her time as a librarian, she had worked on making machine-readable entries and clarifying the uses of numerous databases for college personnel. With the move to a state lease of vital databases, she found the access increased as the price becomes less of an issue per institution.

Peter and Victor discussed the implementation of a new LMS on campus. This recent implementation went very smoothly and Peter discussed the many ways that the system and college worked to ensure a smooth transition. Initially, the college was very open about the system’s decision to move to a new LMS throughout all colleges. Once the system office made a choice, the educational technology office worked to bring in multiple trainers for faculty to
understand the new technology while building master courses for the majority of classes on campus. Victor discussed flexibility, in that he had to travel and learn the new system.

Similar to Grace, Danielle mentioned a transition from paper to electronic forms for data entry. Danielle discussed the software transition for student data entry that greatly reduced the required person-hours researching paper registration forms for needed information. This process was expanded to other division activities based on its proven success.

Likewise, Larry discussed the process of campus registration moving from a paper system to electronic. The number of issues caused by using an antiquated paper system that was no longer commonly used by other colleges created a large project for his area to improve student registration. The software, hardware and programs created for electronic registration had increased on- and off-campus registration opportunities for students.

Colin discussed equipment enhancement using the example of transitioning staff from using one monitor to two. He stated that it was a demonstration that sold the timesaving benefits of the equipment addition, and subsequently almost every person on campus now had a workstation that used a dual display system to increase efficiency.

When the interviewees reflected on their selected projects to see why the projects were successful, the reasons were grouped between efficiency, connectivity and ease of use. Ana found that the students became more studious and better able to systematically solve selected problems using the new program. Bill found that his participation on a national grant gave instructors teaching specialized curriculum a way to connect and brainstorm. Meanwhile, Peter found that the new LMS allowed students and faculty a more effective means of communication to keep up with assignments and grades.
Danielle discovered that the new student survey software was easy to understand with minimal training while Victor found that instructors on campus thought the new LMS was intuitive and quickly more used than the older LMS. Similarly Grace saw the organizational system for library databases as a helpful tool that groups resources to meet individual needs.

When considering the common attributes that successful projects have in common, there were three main factors that the interviewees identified. The first item was to ensure support for the endeavor. As a faculty member, Bill looked for strong student support, as a Dean, Victor considered upper administration support and as CIO, Larry wanted to ensure broad campus support for new projects. The second key feature was the need for understanding and gaining the acceptance of the target audience. For Ana, this involved making sure that you had a good cause that was well funded. Meanwhile for Colin, as an advisor, acceptance of the change is vital. Ginger saw this method as ensuring that you had a well thought out plan that had considered potential challenges and created needed solutions. For Peter, keeping open communication was key to making sure that the implementation went smoothly and all concerns were being met. Similarly, Danielle found that ensuring a tool was easy to use could be a game changer.

**Unsuccessful Technological Change Characteristics and Potential Workarounds.**

Unfortunately, each of our participants was familiar with a project where technological innovation was unsuccessful. Bill began with an example of receiving funding through a state grant for tablets and readers. Unfortunately, the limited surveying that was done before obtaining the grant did not fully capture the lack of need and preference for students to use their own tools. This was a case of technology that was being repurposed from its original intent due to misunderstood demand.
Similarly, while she was working as a testing coordinator, Grace’s area provided access to nine different testing services. While the college encouraged the breadth of testing, there was little to no demand for some of the offered exams. Therefore, the subscriptions for multiple exam companies were discontinued after a usage analysis was conducted.

Danielle discussed the impact of wanting to use software that is too complicated for the user to commit the needed time to learn it. The idea was rooted in the desire to build on successful electronic surveying tools to use a data warehousing solution in-house. In her view, Danielle said that there was an overestimation in the willingness and time commitment needed to have new users teach themselves how to use the tool. There was also a lack of commitment from top-down to encourage usage of the new software.

Larry identified an electronic surveying tool that was leased by the college as another software too difficult to learn. While faculty and staff constantly used surveys, the complex surveying that the software allowed was not needed to that degree by the faculty and staff of the college, and the license was allowed to lapse. Victor also mentioned the effect of time on technology with the example of compressed video, which used to be so vital to be able to bring courses to outlying areas, but improvements in available software and inexpensive personal devices created a lack of need.

Peter mentioned a software package that was put into place by the system office. Banner is a powerful software package that allowed the data from all of the system colleges to be gathered and stored in one location. This allowed the system office to gather information on each of its distinct colleges in a fraction of the time that it used to take when each college sent in their information on an annual basis. Unfortunately, the implementation of the program was very closed and the system office limited training opportunities, software permissions, and
allowed very few requested modifications to the software package. These restrictions limited the feeling of ownership that its employees needed.

Lastly, Colin mentioned the implementation of a software package to allow students to register for advising appointments. The software was limited in its capabilities, only allowing students to make appointments in blocks of time. This did not account for the necessary flexibility of students who only needed a very short visit to their advisor. Also, for students that did not schedule an appointment, but were waiting in the hallway, they would see students who arrived after them granted an advisor visit while they waited. The waiting students were the demise of the program, who contacted the Chancellor and complained about their prolonged wait time.

The consideration of workarounds seemed almost intuitive to the interviewees. Part of the draw of considering alternatives allowed for potential workarounds to occur after a selection is made. For Ana, workarounds consisted of using different resources, and the potential for changes could occur in any aspect of a faculty members job, from the selection of curriculum to pedagogical approach. For Bill, workarounds focused on the connections that one has to people in industry and other colleges. These individuals helped fill in the gaps where funding has fallen short by providing field trip opportunities, conference calls, and posting YouTube videos.

When considering fiscal resources, Danielle said that she looked to grant funding to provide needed resources and eliminate red tape that restricted allowable purchases. Similarly Grace found that funding could be limited by the pressures in the finance department and preferred to wait six months or more before reapplying for rejected funding requests. Colin gave an example of the first time that online courses were allowed on campus. The Vice Chancellor of Academic Affairs was strongly opposed to online courses assuming that they
encouraged laziness in teaching. Therefore, Colin worked with others on campus to offer a few “experimental courses” online under the Vice Chancellors purview. By letting the Vice Chancellor have the needed control over the courses, the faculty of the college were able to demonstrate the benefits of these new course structures and the Vice Chancellor, as an instructor, could see the student demand for more remote course offerings.

In Peter’s position, he relied on working with many individuals across the college, but sometimes one particular area was not allowed to participate in trials due to a Dean’s preference. In that case, Peter searched for another division to approach and implement his idea. Once proven successful, Peter found that the initial division is now “embarrassed into doing the work” due to student and instructor demand for the new approach.

Taking a more delicate approach, Victor gave the example of wanting to ensure five key elements were in every online course offered on campus. Once the elements were identified, the educational technology staff surveyed all of the online courses, and created a master spreadsheet that identified the included elements for each course. Starting with the faculty with the most deficient courses, Victor’s team initiated one-on-one meetings with each faculty member to assist in making course enhancements. This personalized touch worked at a slower pace, but Victor found that it was creating a “growing group of faculty members who will see the benefit and the need for these five elements and they will put them in their courses.” Victor said that tracking the progress of change was also vital to keep up morale for the educational technology staff conducting one-on-one training. These employees needed to visualize success in a more visual manner beyond a spreadsheet. Therefore, he uses two jars of marbles,
One jar is full of marbles that represent the courses that need to change. Then once we meet with them, we move the marbles from one jar to the empty jar so that we can watch it fill up. So we have a bit ceremony after the sessions; the moving of the marbles.

Overall, workarounds were acknowledged by the interviewees, but not preferred by the majority. In most cases, workarounds were seen as needing more time to accomplish a task that should have been quick to implement. Ana expressed frustration at a long-term project that she had been working on to modify curriculum in order to increase program transfer options. She stated that politics were getting in the way of her project and limiting the opportunities for her students. For those that use workarounds successfully, they found that they are the only solution when some roadblocks occur. In Colin’s case, he said that “finding a different approach will help the administrator see the benefits of what you are trying to implement.” Victor discussed the importance of limiting the “heavy handed” approach by calling on upper administration when a project is not allowed. While this was a quick solution to a problem, the long-term benefits would not necessarily be the same.

Following up on disadvantages of using a workaround, Ana said that using this type of approach created an atmosphere of favoritism because the success of a workaround relied on the proposed project and your personal relationship with the individual(s) involved. Bill cautioned that a workaround might follow being told “no” on a project. In that case, one had to be careful not to “cross a line” while trying to pursue one’s goal as you could cause irreparable damage to future projects that you would like to pursue. Larry focused his concern on the lack of business continuity that a workaround created. In his view, following a non-standard path towards a goal wasted time and deviated from the norm.
In reflecting on the advantages of using a workaround, Ana said that it “might be good way to establish an approach for other people to follow.” By providing another way to accomplish a task, others saw a proven method that they can use to accomplish similar tasks in the future. Danielle reflected on a particular situation where the workaround resulted in the needed equipment being purchased, but caused discomfort in the computer services area due to the presence of a technology they don’t prefer to service.

Similarly, Peter found that one of the main disadvantages of attempting a workaround is the amount of time that is required: “sometimes the goal gets lost in just trying to get something done.” Yet, Peter found taking the path less traveled often led to discoveries and new ways of thinking that benefited current and future projects.

**Summary**

While each participant discussed different situations and perspectives of technological changes in which they were involved, three super-ordinate themes emerged from the reflections. These super-ordinate themes allowed the researcher to see the varying and common approaches to diverse projects discussed. The significance of strong institutional support was a strong theme among the interviewees and seen as vital for ongoing technological review, enhancement and excellence. Several of the participants had not considered the impact of the institutional mission, vision and consideration of technology in the strategic plan for the college. Many times the interviewees did not see the need for “technology” to be included in these fundamental guiding documents. Instead they considered their college leadership as a living embodiment of the written documents. Furthermore, participants saw the upper administration’s dedication and commitment to technological enhancements through their daily actions and speeches.
When attempting to implement a technological change on their campus, another significant theme emerged interviewees: the importance of a targeted approach to rally campus support for implementing new technology. The need for clear understanding of the concerns of the administration that had influence over a project’s success came across in each interview. Choosing to engage key faculty and staff when creating a pilot project allowed for strong success and was a commonly used technique among the participants. Depending on the scope of the project, conversations with the campus CIO had to be well planned and include adequate support for successful infrastructure upgrades. Lastly, the interviewees gave insight into the strategies they prefer to use when planning a technical change.

As the participants reflected on projects that they were a part of the importance of concise research and consideration of workaround strategies was crucial for technical projects to be fruitful. One aspect that all interviewees mentioned was the negative connotation that “change” inspires and methods they used to help ease individuals into accepting something new. While reviewing projects in which they participated, key themes developed from both successful and unsuccessful technological projects. During reflections on projects that were not fully implemented, the consideration of workarounds was discussed and debated. Each of these themes and the data that support them gave the researcher a better understanding of what employees of a community college encounter when planning and executing a technological change at their institution.
Chapter Five: Discussion and Implications for Practice

This qualitative study interviewed staff and faculty members of a select southern community college and explored their experiences with technological innovation on their college campus. The purpose of this research study was to focus on the effective methods that may be employed by a college, faculty or staff member to influence technological innovation at a community college. The interpretive phenomenological approach research method allowed for reflection on the interviewee’s personal experience in technological endeavors to gain a unique insight based on the interviewee’s position in the college (Smith et al., 2009). This study was guided by the central research question: What are the main factors and relationships that allowed a technological change to occur within a community college?

The Diffusion of Innovations (DoI) theoretical framework by Rogers (2003) provided a lens through which to examine the experiences of the study participants to identify how innovations are supported through multiple facets in the community college setting. Three super-ordinate themes emerged through the analysis of the gathered data. These themes outlined that strong institutional support is fundamental for ongoing technology initiatives; a targeted approach is instrumental in gathering campus support for new technologies; and concise research and workaround strategies are crucial for successful technological proposals and implementation.

This chapter discusses the super-ordinate themes and subthemes in light of the theoretical frameworks and associations or enhancements to existing literature on this topic. The researcher then examines the significance of the study identifying suggestions for implementation. The chapter concludes with recommendations for further research on the methods that administrators, faculty, staff and students of community colleges can utilize to increase technological innovation.
at their campus in a planned, focused manner that aligns with the college’s mission and vision statement.

Each super-ordinate theme contains a number of subthemes. Figure 4 includes a summary of the layout where each super-ordinate theme and associated subthemes are discussed along with the connections of the findings to in previous studies.

**Figure 4. Super-ordinate themes and subthemes**

| Strong Institutional Support is Fundamental for Ongoing Technology Review, Enhancement and Excellence |
| • Mission and Vision Statements That Support Technology |
| • Strategic Plan That Contains Clear Processes and Procedures for Review and Enhancement of Technology |
| • Progressive Technology That is Valued and Implemented for Teaching and Learning Excellence |

| A Targeted Approach is Vital to Rally Campus Support for Implementing New Technology |
| • Paramount Issues of Key Administration |
| • Support of Key Faculty and Staff |
| • CIO Concerns and Limitations |
| • Successful Implementation Strategies |

| Concise Research and Workaround Strategies are Crucial for Successful Technological Proposals and Implementations |
| • Key Methods to Facilitate Acceptance of a Technological Change |
| • Successful Technological Change Characteristics |
| • Unsuccessful Technological Change Characteristics and Potential Workarounds |

**Connections of Findings to Previous Studies**

**Strong Institutional Support is Fundamental for Ongoing Technology Review, Enhancement, and Excellence.** Technology on a college campus is a complex entity requiring sufficient planning within a technological vision that aligns to the college’s mission and vision statements (Keengwe, Kidd & Kyei-Blankson, 2009). Only one of the interviewees could confidently discuss the current college mission and vision statements. All of the participants found guidance in their campus leadership when considering technological enhancements. There
was no mention of technology in the college’s posted mission or vision statements, yet the participants stated that there was a strong push from administration for increased technological initiatives. The interviewees stated that the pursuits of campus leadership did not always follow the posted mission and vision statements. During the interviews, each participant mentioned the lack of a technological vision statement for the campus and how such a document could help guide campus technology and encourage further innovation. According to the literature, creating a timeline of technological modifications through a targeted yet flexible vision statement helps ensure smooth transitions (Chang, 2012; Hew & Brush, 2007).

Following the implementation of technology, it was vital that appropriate training was tailored for each group within the organization using the new enhancement (Aldunate & Nussbaum, 2013). Both the CIO and the educational technology staff discussed the importance of required training targeted for areas of the campus that are impacted by changing technology. As colleges move to a largely electronic infrastructure, a common trend in schools today, they create the need for a common direction, often stated in a campus strategic plan (Barber, 2011; Minamoto & Nishigori, 2014). The CIO is responsible for the safety of the technology areas on the campus and can help guide and shape the strategic plan considering the unique features of the campus (Drury, 2009; Maglyas, Nikula & Smolander, 2013).

The participants discussed the college’s move to a business model focus with decreased funding from the state and stronger reliance on tuition dollars. The movement to a business model is consistent with the need for community colleges to enhance their technology in course offerings to prepare students to meet area needs (Barber, 2011; Harryson et al. 2008). The interviewed faculty focused on methods they used to enhance their student experience both in the classroom and outside the classroom through tailored homework assignments. Participants
discussed the challenges of distributing new ideas and innovations on a large campus; this is consistent with Rogers (2003) discussion of communication channels that can vary greatly based on the unique dynamics of a particular college environment.

**A Targeted Approach is Vital to Rally Campus Support for Implementing New Technology.** Many of the examples of technological innovation that were given by the participants involved a bottom-up strategy (Kezar, 2012). In these cases, the faculty and lower-level staff identified potential technological innovation that they were willing to pursue on their own campus. Participants often discussed the importance of finding flexible and supportive personnel in upper administration to bring new ideas. This building of trust between faculty leadership and administration was identified as paramount in Kezar, Lester, Carduci, Gallant and McGavin’s (2007) work on methods of effective change.

Participants discussed the value of creating trusted relationships among peers. These relationships allow faculty to work effectively beyond traditional teaching roles and promote innovation (Cho, Hwang & Lee, 2012). This was consistent in the literature where Turner (2014) identified effective technology leadership teams were vital to navigating the bureaucracy of a college and successfully implementing innovations on campus. Furthermore, Sahin (2006) discusses the importance of understanding the perceived impact of a new innovation. The participants discussed this apparent impact and the value for their projects to align with the current endeavors of their supervisors and supporting faculty and staff.

There was a clear difference among the participants when discussing the CIO for the college. The interviewees discussed the need to have clear and open communication between the CIO and all levels of the organization to ensure effective management of services. It was clear in talking with the campus CIO that one function of his position was to maintain a vocal presence
updating the appropriate personnel of technological advances and deficiencies (Menz, 2012). Fundamental to the core success of any system project is a clear path of communication and a culture that embraces change (Ram, Corkindale & Wu, 2013). There was discussion among the participants about the importance of a paced and clear approach when meeting with the CIO. Furthermore, two of the interviewees discussed methods they use to show appreciation to the CIO and his staff via pizza parties and training opportunities in the hope of strengthening the working relationship with the CIO’s area and expediting technological implementations.

When considering interactions with supervisors and administration, the participants discussed the importance of detailed research including a funding source. Several of the key features identified included funding streams, successful implementations on other campuses, and keeping in touch with the current pressures of upper administration. Ulrich (2011) identified the value of a campus supporting technological leadership to pursue early adoption of new advancements. Furthermore, those implementing technological change need to understand the potential impacts and therefore fully grasp the needed technological and implementation ramifications (Hsu, 2015; Wu, Thames, Rosen & Schaefer, 2013).

**Concise Research and Workaround Strategies are Crucial for Successful Technological Proposals and Implementations.** When pursuing a technological modification, there are five considerations: organizational demographics, informational intensity, organizational culture, external environment characteristics, and IT function characteristics (Mohamed & Kaur a/p Gian Singh, 2012). Several participants discussed their need to provide specific information to their immediate supervisors when approaching them with a new idea. This supports the research of Maglyas, Nikula and Smolander (2013), which found that
supervisors did not need to know all of the details when implementing a new plan, and giving too much information to administration could delay the process.

When faculty assumed additional projects, there was concern about the need to receive compensation for the additional time that they are taking to implement a new innovation. This aligns with Amey and VanDerLinden’s (2003) findings that administration needs to provide adequate release time for successful implementation and to decrease potential disenfranchisement among eager faculty. In addition, Liu (2011) identified that it is vital that enough time be allocated to help ensure the success of a new implementation. This idea was observed in the participants who also maintained that a positive attitude went a long way to encouraging adoption of a new technology among their peers.

There was a general dislike of pursuing workarounds among the participants, yet each participant gave examples during their interview of times when workarounds seemed to be their only option. Consistent with the findings from Ferneley and Sobreperez (2006), the interviewees found workarounds to be time-intensive and usually focused on politics or matters that do not involve technology. The interviewed staff stressed the need to include examples specific to the needs of their trainees when designing training. This resonates in Machado’s (2012) findings that trainees in new technology need to be connected to the new material. Without a direct application, participants noted a decrease in usage and delay in acceptance of a new technology.

**Connection of Findings to the Theoretical Framework**

**Value of Strong Institutional Support for Technology.** The participants expressed a strong connection to their institution and found guidance in pursuing technological innovations that aligned with the views of their Chancellor and upper administration. For the interviewed faculty, the motivation to provide the most up-to-date technology in the classroom was vital and
encouraged them to be early adopters, especially in the technology-driven areas of network security and engineering (Rogers, 2003). As the participants discussed their experiences relating to technological endeavors, there was a difference among those who have been in a college environment for an extended time. For these participants, there was a sense of understanding and calmness about the potentially long time that it takes to complete a task. These interviewees intuitively understood that there was a length of time that needed to be considered to complete new technological endeavors (Harryson et al., 2008; Rogers, 2003). For these faculty and staff, there was an understanding of the institutional mission and vision beyond what was written within the college’s strategic plan.

In particular, the educational technology staff said a particularly strong sense of purpose was directed to their area to help lead the college into adopting new technology that aligned with the vision of the current Chancellor. In this case, both staff members worked at the college under three Chancellors and commented about the different guiding principles that each administration directed toward technological innovation. The first Chancellor was seen to have an aversion to technology. This trait was also common with the current Vice Chancellor of Academic Affairs who did not want the college to pursue online classes. Gopalakkrishnana (2014) also found that similar concerns were raised among faculty when required to teach online courses and Machado (2012) identified one of the underlying reasons as the lack of sufficient training for a new approach. Workarounds were employed to allow closely monitored online class offerings on a trial basis, to ameliorate the concerns of the upper administration (Barber, 2011). This shows a method that early adopters to a new technology, like online class offerings, employed to be allowed to innovate in a manner that late adopters, like the upper administration, would be comfortable in pursuing (Rogers, 2003). By allowing a delayed implementation of
online offerings, the college’s Vice Chancellor was allowed the time to learn that the value of online education is at least equal to the face-to-face offerings (Baran, Correia & Thompson, 2013).

The second Chancellor was said to have employed more progressive methods and rushed to implement new technological innovations. One participant discussed this Chancellor’s passion for a progressive new online course offering that would follow the tradition of Massively Open Online Course (MOOC) in creating free developmental course offerings. There was the need to refocus the college’s purpose as it sought to serve more students under a growing pressure to increase tuition dollars. According to another participant, the creation of these MOOCs allowed for a broader awareness of the college through the international awards that were received and a shift in the mission to reexamine their developmental education offerings (Breslow, Pritchard, DeBoer, Stump, Ho & Seaton, 2013). The educational technology staff spoke to the current Chancellor’s focus on pursuing more international online students to help meet the growing tuition demands.

The advising interviewee reflected that the shift from the earliest Chancellor to the second was challenging as second Chancellor’s preference for early adoption of new technologies was at odds with what many of the administration were accustomed. Rogers (2003) theorizes that innovators and early adopters are in the minority and therefore early adoption of technology tends to occur over an extended time period. Due to financial issues, the educational technology staff said that the second Chancellor worked hard encourage the majority of the college to adopt new technologies and ideas like hybrid course offerings and compressed video to allow the college to reach a broader audience and a wider funding stream. The literature identifies the need of critical mass for a new technology to be fully accepted (Liu, 2011; Ranjan,
The changing world view of technology requires colleges to now focus on justifying and proving their excellence which allowed the second Chancellor to carve a niche out for his college, one that worked on preparing students for the college environment (Sargenti, Lightfoot & Kehal, 2006).

The grant staff member spoke to several of concerns that arose when trying to implement new technology on the campus. As seen in Keengwe, Kidd and Keyei-Blankson (2009), the staff member found frustration with the campus policies and procedures that limited her ability to execute new technological ideas in a timely fashion. In order to circumvent funding concerns, Ana, Bill and Danielle were able to seek out and provide grant funding for the projects that they were interested in pursuing. This need for external funding to support limited infrastructure resources has been cited in the literature (Moloney & Oakley, 2010).

**Importance of Campus Support for New Technology.** One of the most important aspects to the success any new technology is providing adequate support and resources (Keengwe, Kidd & Kyei-Blankson, 2009; Wright & Wilson, 2011). In the case of this southern community college, the Educational Technology department was composed of five staff members and provided on-site training and resources for new technologies that are used in teaching. When a new Learning Management System (LMS) was instituted by the governing system, the current Dean of Educational Technology provided Victor with any needed resources to seek training on the new LMS. With such latitude, the educational technology dean was allowed the time to visit other sites with the same LMS and enroll in training seminars to gather the needed information to train his college’s faculty and staff on the new system. This flexibility of time is vital to the Innovation-Decision (ID) process that allows one to learn about all of the components of a new technological innovation (Rogers, 2003). The participants aligned with the
steps in the ID process when gaining knowledge about their new potential technology, first seeking to persuade the appropriate superiors to make the decision to implement the technical change and then confirm the decision for future applications.

All participants spoke highly of the campus’ funding mechanism for technology called the Technology Fee. According to one participant, this student-imposed fee generated a pool of available money that allowed the college to fund well-researched requests from faculty and staff that support the campus students. The dean spoke to this vital funding mechanism that allowed the campus to afford the previous LMS. With the changing demands placed on colleges to provide data on all facets of their campus, technology is also vital in reporting statistics on enrollment, finances and academic outcomes (Ranjan, 2008). The many ways that technology is integrated into the college environment beyond the classroom has grown substantially (Barber, 2011; Harryson et al., 2008; Ranjan, 2008).

The grant participant discussed the experience of implementing a new survey and requiring those who would be using the survey to learn the material using online guides. The survey implementation failed to be successful in part due to the lack of willingness of others to find the time to train on the software. Part of the issue was the inherent complexity of understanding the survey results. The literature discusses this concern of needing to provide adequate time when learning a new technology no matter the complexity of the material (Aldunate & Nussbaum, 2013).

Participants that had been at the college the longest all identified scenarios that targeted training to their audience and resulted in a successful outcome. In one case, it was vital to make sure that the trainee sees a direct application to their specific job is a priority of any training that he delivers. The educational technology staff set up times to meet one-on-one with individuals
to provide intense training time that allows for a tailored training meeting the exact needs of the trainee. There was also discussion about the importance of creating a group of trained individuals in the same job title that can support each other beyond the training dates. This idea of a social system, found in Rogers’ (2003) fourth stage of DI, creates a common bond between the shared responsibly to support the trainees after exposure to a new idea. The network security faculty discussed their excitement of working with a group of educators on a national grant that had a common discipline and passion to teach students the most relevant information. Furthermore, participants discussed the importance of always providing a positive approach when discussing or training on any new idea. This perceived enthusiasm encouraged those learning about the new material to be excited and more accepting of the change, commonly known as relative advantage (Laukkanen, 2016; Rogers, 2003).

Participants discussed the methods that they employed to ensure a good working relationship with the computer services area, strengthen their social system with the area, and establish clear communication channels (Rogers, 2003). All participants spoke highly of the campus computer support staff. In particular, the library provided pizza parties after a large project with the computer services area to show their appreciation. Similarly, the faculty included funding for the computer services staff when pursuing grants to train in technological areas that the computer services staff would find useful. The educational technology staff mentioned that he made sure to only approach the CIO when he had a direct need and made sure to have the backing of administration before the planned meeting.

In talking with the CIO, there were several concerns that arose when implementing the new Enterprise Resource Planning (ERP) system for the college called Banner. One of the most challenging aspects to any CIO’s position is the requirement to implement a brand new system
campus wide (Ngai, Law & Wat, 2008). In order to ensure a successful implementation, there needs to be support from the upper management, a champion for the new implementation, ERP teamwork and composition, clear project management, and change to management program and culture that embraces the ERP system (Ngai, Law & Wat, 2008).

In reviewing the first item, clear support from the upper management of the institution clarified the importance and dedication of the college to embracing the new technology. This may require a change in the culture of the college, a culture that embraces change and allows for the technological concerns that may arise when implementing a new system (Kim, Lee & Gosain, 2005). There is also a clear champion who is updating the campus on all the new changes and positive benefits of the upcoming system. This does not have to be the CIO, but it is vital that the spokesperson can clearly communicate technical details to those who may be less comfortable with the jargon (Kim, Lee & Gosain, 2005).

Such a large system update does not occur without a team of individuals working together, within their own integrated areas, to help ensure a smooth implementation and transition (Kim, Lee & Gosain, 2005). This team also allows for multiple points of contact to support the changes and discuss any concerns that may arise. This team would also serve with the project and program management group that helps to ensure a smooth integration of the new application from the existing system (Dezdar & Ainin, 2011). This clear communication is fundamental to maintain a culture on the campus that is moving with the technological innovation engineered by the CIO’s office.

**Strength of Research and Consideration of Workarounds.** The participants discussed technological changes that they have implemented with passion and found lessons to learn from when looking back on unsuccessful implementations. They were motivated to pursue
technological changes by their courses, students and peers who demonstrated a successful change. In discussing their experiences, participants identified key components also outlined in Rogers (2003) Diffusion of Innovation (DOI) framework that guided their approach: innovation, communication channels, time, and social system.

The interviewees discussed the complex process of making any change on campus that went beyond what they could personally implement. The faculty discussed the need to bring significant changes in their classroom to the attention of their immediate supervisor. When implementing a bottom-up change (Kezar, 2012) there was a consensus among all participants to not rush the process and make sure that they had tested the waters to see if there would be resistance to their proposed recommendations. The educational technology staff discussed the importance of a grassroots-level support (Hsu, 2015) for new technology to ensure that their instructors are connecting with their students and using the technology available.

The tenured participants spoke about the ineffectiveness of the college’s last two Chancellors who demanded faculty and staff follow their changes. This top-down leadership style was stated as ineffectual, to the extent that the Chancellors’ requests were completed, but the results were not well received or desired (Turner, 2014). In many cases, the faculty and staff were able to continue their preferred methods and could avoid implementing the demanded changes without reprisal. This was true of the implementation of the new ERP system for the college. The last Chancellor wanted the college to be the first in the system to implement the new ERP and there were many setbacks. Most of the changes occurred among the staff in the registrar and financial aid office. The staff turnover in these areas was significant.

There was a marked difference when the interviewed faculty and staff discussed the transition of the campus LMS from Blackboard to Canvas. This change took place under the
current Chancellor and was a lengthy process. After providing open forums for faculty and staff to ask questions and voice concerns, areas called sandboxes were provided to allow campus personnel to practice with the new software. The educational technology staff provided in-depth training in groups and for individuals to assist in transforming online course offerings to the new system. This multifaceted process allowed for campus-wide engagement and has been shown to be a proven strategy in making an effective change (Gioia & Chittipeddi, 1991; Maitlis & Christianson, 2014).

Overall there was a strong preference by all of the participants to not pursue workarounds. The interviewees stated that workarounds take significantly more time to achieve the same outcome as following standard channels and may result in upsetting administration due to the non-standard method of execution. In one case, the engineering faculty member expressed clear frustration in attempting to pursue regular channels to get a degree modification resulting in her lack of encouragement to pursue any future changes. Without faculty understanding the reasoning behind requested changes being denied, their willingness to pursue future changes is greatly diminished. Kezar, Lester, Carduci, Gallant and McGavin (2007) saw the importance of faculty having a strong personal relationship with administration to pursue common goals and interests.

**Significance**

**Scholarly Significance.** This study adds to the literature on how to create an effective leadership environment that stimulates technological innovation in a community college environment. In particular, it highlights the importance of colleges to include a technological vision that encourages progressive innovations in technology supporting academic endeavors in the mission and vision statements while imbedding technology design in the strategic plan for the
college. Furthermore, it gives multiple best practice approaches to researching and pursuing a variety of technological innovations on a community college campus. It adds to the larger quantitative study by focusing on the methods that select members of a community college can employ from a bottom-up design to implement needed technological change. This study provides an example of how staff and faculty pursue the Innovation-Decision process when researching and implementing a new technical change. There are also methods discussed on concerns that arose while working with the CIO and non-teaching staff including techniques to encourage timely integration of new technology.

The research provides an example of how a community college can create a collaborative and supportive environment to ensure their college remains on the cutting edge of innovative and enhanced pedagogical approaches that seek to engage their students by the most effective means possible. The findings in this study also include methods, techniques and approaches to avoid when seeking to encourage a new innovation. This study identifies benefits of creating strong communication channels and a social network at the institution and beyond that allows for a safe environment to test and develop new approaches for the college and the classroom. The outcomes of this study provide proven plans and methods for considering and implementing new innovations while strengthening the relationships that create a supportive network. This study provides successful strategies to tailor approaches that align with administrative goals and techniques in work with the campus CIO and other non-teaching staff.

**Practitioner Significance.** This study is meaningful to community college faculty and staff members who pursue technological change on their campus. Practical implications include ways of approaching immediate supervisors and upper administration along with methods to more clearly understand the current pressures and demands of the administration that could
impact plans for technological enhancements. There is also information about the structure of a college including larger accreditation and system pressures that guide the focus of upper administration. In addition, techniques are provided to guide interactions with colleagues and staff members in vital areas of the college. In particular, the findings provide insight and guidance on working with the college CIO and computer services staff to create a strong working relationship while understanding the areas demands and responsibilities.

Campus administrators who seek to create a technologically innovative environment at their campus that facilitates optimal educational experiences for students while building a collaborative and supportive environment for faculty and staff will also benefit from the study. The practical implications of this study include the value of long-term planning in strategic campus documents which allow for flexibility in changing technological innovations while supporting and rewarding innovative campus community members who pilot new approaches that enhance the college’s offerings. In addition, there is a successful method outlined that provides funding for technological endeavors that directly impact student success.

The areas that emerged from this study are vital to consider when creating an educational environment that values student engagement and providing optimal training to meet the needs of area employers. There is a focus on the methods to gain campus and individual support for new technological endeavors while outlining successful methods for new technological proposals and funding avenues. This study provided an in-depth look at bottom-up leadership strategies that support grassroots innovations in the community college environment.

**Recommendations for Future Practice**

While there is research in the strengths of technological leadership for upper administration, there is a lack of detailed qualitative analysis investigating bottom-up innovations
and collaborative relationships that support technological enhancements at colleges (Barber, 2011; Drury, 2009; Keengwe, Kidd, & Kyei-Blankson, 2009; Kezar, 2012; Rogers, 2003). Furthermore, there is little research beyond upper administration and faculty when looking at implementing technological innovation. This leaves multiple areas of a college open to focused longitudinal research that could include advising, finance, registrar, academic deans, computer services and the provost (Amey & VanDerlinden, 2003). These areas all interact with students directly or indirectly and support the academics of the college, but have limited research into practices that improve their technological interactions (Crotts, Dickson & Ford, 2005; Maglyas, Nikula & Smolander, 2013).

While this paper has looked at the bottom-up technological leadership, there is also room for additional top-down leadership research supporting the effective strategies that upper administration can employ to encourage faculty and staff to pursue and engage in advancements (Kezar, 2012; Kezar & Lester, 2011). In addition, there is room for conducting additional research exploring the effective strategies to interact and build relationships with campus CIO and institutional research offices (Chirikov, 2013; Dezdar & Ainin, 2011). By supporting the technological backbone of the college, the CIO is instrumental in providing opportunities for improvements in the infrastructure supporting the educational opportunities engaging with technology (Drury, 2009).

Future research could be conducted in the outcomes of technology boot camps for faculty and staff across specific platforms of technological innovations (Johnson, Wisniewski, Kuhlemeyer, Isaacs & Krzykowski, 2012). Furthermore, there exist opportunities to research the reasons behind faculty and staff resistance to adopt technology in higher education and methods of creating collaborative spaces that support experimentation within disciplines for new
technologies (Kotrlik & Redmann, 2009). Another area of qualitative research could be identifying technological innovators within the college and supporting opinion leaders who work together to create strong teams that are able to implement new technology (Rogers, 2003). Another area of research could include identifying best practices in colleges that have created successful mission, vision and strategic plans supporting changing technologies that enhance educational offerings (Keengwe, Kidd & Kyei-Blankson, 2009).

Conclusion

This study explored the self-reported experiences of faculty and staff at a southern community college who personally pursued technological innovation to improve the technology experiences at their institution. Participants reported that, despite insufficient funding and also understanding of technology needs by administrators, there were multiple avenues to allow a successful innovation in technology even when the interviewees did not have optimally supportive settings. The perseverance of the participants in pursuing an innovation, even when they faced rejection and needed to employ a workaround to accomplish the desired change, was a testament more to the ability to form strong social connections (Kezar, 2012; Rogers 2003) than their technological expertise. The key finding of this study is that technological innovation and implementation requires a need for that social connection that encompasses administrators, faculty and staff.
References


Appendix A- IRB Approval

Notification of IRB Action

Date: October 20, 2015
IRB #: CPS15-10-11

Principal Investigator(s): Carolyn Bair
Laura Goardich

Department: Doctor of Education
College of Professional Studies

Address: 20 Belvidere
Northeastern University

Title of Project: Leadership Approaches for Effective Technological Change in
Community Colleges

Participating Sites: Bossier Parish Community College permission in file

Informed Consent: One (1) unsigned consent

As per CFR 45 46.117(c)(2) signed consent is being waived as the research presents no more than
minimal risk of harm to subjects and involves no procedures for which written consent is normally
required.

DHHS Review Category: Expedited #6, #7

Monitoring Interval: 12 months

Approval Expiration Date: OCTOBER 19, 2016

Investigator’s Responsibilities:
1. Informed consent form bearing the IRB approval stamp must be used when recruiting participants
   into the study.
2. The investigator must notify IRB immediately of unexpected adverse reactions, or new
   information that may alter our perception of the benefit-risk ratio.
3. Study procedures and files are subject to audit any time.
4. Any modifications of the protocol or the informed consent as the study progresses must be
   reviewed and approved by this committee prior to being instituted.
5. Continuing Review Approval for the proposal should be requested at least one month prior to the
   expiration date above.
6. This approval applies to the protection of human subjects only. It does not apply to any other
   university approvals that may be necessary.

C. Randall Colvin, Ph.D., Chair
Northeastern University Institutional Review Board

Nan C. Regina, Director
Human Subject Research Protection

Northeastern University FWA #4630
Appendix B – Recruitment Email

I am working on a doctoral study at Northeastern University to gain insight into the underlying reasons for successful technological projects on a community college campus. The core research question is

*What are the main factors and relationships that allowed a technological change to occur within a community college?*

If you are willing to participate in this study based on your experience working at least one year at a Community or Technical College in the United States. In addition, you have experience implementing a technological improvement at the institution in which you are employed. One of the goals of this survey is to identify strategies that are useful or detrimental to attempting a technological change on your campus at all levels of leadership.

The study consists of one interview, which may be conducted either by phone, Skype® or Google Hangout®. All interview questions will be provided to you prior to the scheduled meeting to ensure that we can make the best use of our time. After the interview, I will transcribe our conversation and send a copy of the transcription for your review.

All efforts will be made to keep your participation confidential; your name as well as any mentioned in the interview will never be shared with others or used in the published results. Participation is entirely voluntary.

If you are interested in participating in the study, please email me at goadrich.l@husky.neu.edu, and I will forward you an electronic copy of Consent Form, which tells you a bit more about the study and answers some common questions people often have in regards to research. I ask that you please read it over before the interview. If you have any questions or concerns, you are of course free to contact me. We will go over the Consent Form together at the beginning of the interview, giving you another chance to ask any questions. If you then decide to continue with the interview, you will just have to give verbal consent at that time.

This study is conducted by Laura Goadrich, an EdD doctoral candidate at Northeastern University. This study has been approved by Northeastern University’s Institutional Review Board for research ethics (IRB#).
Appendix C – Informed Consent

Northeastern University, Department of Education

Name of Investigator(s): Carolyn R. Bair, Ph.D. (Principal Investigator), Laura Goadrich, M.S., M.S. (Student Researcher)

Title of Project: Leadership Approaches for Effective Technological Change in Community Colleges

Request to Participate in Research
We would like to invite you to take part in a research project. The purpose of this research is to give insight into the underlying reasons for successful technological projects on a community college campus.

You must have worked at a Community of Technical College in the United States for at least one year to be in this research project.

The study will take place virtually and will take about 45-90 minutes. If you decide to take part in this study, we will ask you to participate in one interview (conducted by Laura Goadrich) about your experiences in attempting to implement technological changes on your campus.

There are no foreseeable risks or discomforts to you for taking part in this study.

There are no direct benefits to you for participating in the study. However, your answers may help us to learn more about successful and detrimental techniques in attempting to implement technological modifications on a Community or Technical College Campus.

Your part in this study will be handled in a confidential manner. Only the researchers will know that you participated in this study. Any reports or publications based on this research will only use pseudonyms, and will not identify you or any other participant as being part of this project.

The decision to participate in this research project is up to you. You do not have to participate and you can refuse to answer any question. Even if you begin the study, you may withdraw at any time.

If you have any questions about this study, please feel free to contact Laura Goadrich (Tel: 318-529-8294, Email: goadrich.l@husky.neu.edu), the person mainly responsible for the research. You can also contact Dr. Carolyn Bair (Northeastern University, Boston, MA, Email: c.bair@neu.edu), the Principal Investigator.

If you have any questions about your rights in this research, you may contact Nan C. Regina, Director, Human Subject Research Protection, 960 Renaissance Park, Northeastern University, Boston, MA 02115. Tel: 617.373.4588, Email: irb@neu.edu. You may call anonymously if you wish.

You may keep this form for yourself.
Thank you.

Laura Goadrich
Appendix D – Interview Protocol

The interview questions are designed to elicit discussion focused on the research objectives. The questions guided the interview to focus on the methods that the interviewee used when working toward a technological change on their campus. Prior to the interview, participants received an email outlining the objectives and time commitment of the future meeting and informed consent paperwork. To begin, the interview had opening questions focused on the interviewee’s background in higher education, demographic information and experience with technological change in a college environment. Next, the questions focused on the campus procedures required when technology involved. Building on the established procedures, the interviewee’s personal goals were explored ending with their recommendations for future technological change.

Opening Questions:

1. Please give a description of your role and responsibilities in the college.
2. What were your past duties/titles leading up to your current position in the college?
3. What is your role in supporting changing technology on your campus?
   a. Do you enjoy the role that you have?
   b. What changes would you like to see to your role and why?

Questions about Technology at Interviewee’s Campus:

4. To what extent have technology and technology issues become part of the mission of your college?
   a. Is there a technology vision on your campus? If so, please describe.
   b. Is there a technology-focused strategic plan on your campus? If so, please describe.
c. How are new technological ideas on your campus reviewed and considered for implementation?

5. What technology-related issues are most important to administrators on your campus?
   a. Why do you think these issues are important to them?
   b. What events of the past make these issues important to your administrators?
   c. When you pursue a new technological issue, how do you approach your administration?
   d. When you pursue a new technological issue, how do you approach the staff and faculty?

6. What is the typical way that new technology is implemented at your college?
   a. Is it different for faculty and staff? If so, in what way?
   b. How do faculty and staff on your campus react to technological change?

7. How do you feel when a technological change takes place? What approach does your supervisor have when new technology-focused ideas are proposed?
   a. What methods do you use to help ensure more acceptance of a new idea?
   b. Are there any methods that you avoid to help ensure the change will be accepted?

8. What approach does your Chief Information Officer have when new technology ideas are proposed?
   a. What methods do you use to help ensure more acceptance of a new idea?
   b. Are there any methods that you avoid to help ensure the change will be accepted?

9. What type of funding is available on your campus to pursue technological change?

Questions for Interviewee’s Technology Goals:

10. What role do you think technology ought to play in teaching and learning?
a. How is that role communicated to faculty, staff, and students?

b. How does technology encourage or inhibit procedures that didn’t previously use technology?

11. How does technology impact your work?

12. Give an example of a technological change that you have been a part of in the college that has been successful.

   a. What do you feel led to the success of the project?
   
   b. Is it still used today? Or has it changed/adapted?
   
   c. How did administration react to the needed change?
   
   d. How did your peers react to the proposed change?
   
   e. Why do you feel that the change was successful?

13. Given an example of a technological change that you have been a part of in the college that has not been successful.

   a. What do you feel led to the failure of the project?
   
   b. Was the technology changed and then implemented? If so, how?
   
   c. How did administration react to the needed change?
   
   d. How did your peers react to the proposed change?
   
   e. What particular issue made the change unsuccessful?

14. Reflecting over past technological changes that you have taken part in,

   a. What do the successful projects had in common? Why?
   
   b. What do the unsuccessful projects had in common? Why?

Questions for Future Technology Pursuits:
15. If you were to pursue a technological change now on your campus, what path/procedures would you follow?
   a. What would make this path/procedure work better?
   b. What relationships do you have that would encourage the technological change you are pursuing?
   c. What past partnerships do you have that would inhibit the technological change you are pursuing?
16. When you are not allowed to pursue a technological change, but know that a change needs to occur for a needed benefit, what types of workarounds do you pursue?
   a. Please give an example.
   b. Has the workaround helped to ensure that the change occurs in a more palatable form on campus?
   c. Would there have been another way to approach the needed technological change so that you wouldn’t have to pursue a workaround?
   d. What disadvantages and advantages were there to pursuing the workaround?
17. What would you see as the ideal process to implement new technology on your campus?