
SCHOOL *of* GRADUATE STUDIES
EAST TENNESSEE STATE UNIVERSITY

East Tennessee State University
Digital Commons @ East Tennessee State University

Electronic Theses and Dissertations | Student Works

5-2010

A Study of the Integrated Alignment of Technology and Organizational Strategic Planning in Small Private Liberal Arts Colleges and Universities.

Shereé Ann Schneider
East Tennessee State University

Follow this and additional works at: https://dc.etsu.edu/etd

 Part of the Higher Education Administration Commons

Recommended Citation

Schneider, Shereé Ann, "A Study of the Integrated Alignment of Technology and Organizational Strategic Planning in Small Private Liberal Arts Colleges and Universities." (2010). *Electronic Theses and Dissertations.* Paper 1668. https://dc.etsu.edu/etd/1668

This Dissertation - Open Access is brought to you for free and open access by the Student Works at Digital Commons @ East Tennessee State University. It has been accepted for inclusion in Electronic Theses and Dissertations by an authorized administrator of Digital Commons @ East Tennessee State University. For more information, please contact digilib@etsu.edu.

A Study of the Integrated Alignment of Technology and Organizational Strategic Planning in Small Private Liberal Arts Colleges and Universities

---

A dissertation
presented to
the faculty of the Department of Educational Leadership and Policy Analysis
East Tennessee State University

In partial fulfillment
of the requirements for the degree
Doctor of Education

---

by
Shereé A. Schneider
May 2010

Dr. Jasmine Renner, Chair
Dr. Terrence Tollefson
Dr. Catherine H. Glascock
Dr. Terry Countermine

Keywords: Strategic Planning, Technology Planning,
Alignment, Mission, Vision, Budget, Goals, Assessment

ABSTRACT

A Study of the Integrated Alignment of Technology and Organizational Strategic Planning in Small Private Liberal Arts Colleges and Universities

by

Shereé A. Schneider

The purpose of this study was to determine the relationship between technology planning and strategic planning in small private liberal arts colleges and universities that were members of the Appalachian College Association (ACA). The objective of the study was to determine if the technology initiatives were appropriately aligned to the institutional strategic plans. I sought to discover the perceptions of key administrators within the ACA institutions regarding their role in the planning processes at their institutions and to determine if the planning processes were effectively used as a tool for adequately communicating technology needs to their departments.

Participants in the study consisted of administrators from institutions who were members of the ACA and served in the capacities of first-level academic, administrative, or information technology administrators (vice president, chief operating officer, etc.) and the second-level administrators who reported to them. Key administrators were selected based on their role as institutional planners for either strategic or technology initiatives. An online survey instrument was used to collect the data. The survey was developed using a framework based on published research identified and outlined in the literature review.

The survey consisted of 25 questions that required either a yes or no answer or a 5-point Likert scale answer. Survey data were analyzed using descriptive and inferential statistics. The study

showed no significant relationship between the positions of administrators or based on the size of the institution measured in FTE enrollment regarding their perception that technology is an integral component of the strategic planning process at their institution. The study also indicated there was no significant relationship between the positions or based on size of the institution measured in FTE enrollment that key administrators were involved in planning for technology within their institution. In addition, the study indicated there was no significant relationship between the positions or based on size of the institution measured in FTE enrollment that institutional budgets were aligned with the process of strategically planning for technology during the strategic planning process.

DEDICATION

This dissertation is dedicated to my family who have supported me my entire life but especially as I journeyed this stage which involved completing this manuscript. First, I would like to dedicate this to my dad, Dorsey Humfleet, who passed away before I finished. He was very proud my sister and I were pursuing this degree. Next, I would like to dedicate this to my mother Katherine Humfleet who is the rock of our family. Without her encouragement and support I am convinced I might never succeed at anything. Her continuous support and encouragement are priceless. I could never forget my sister Brenda Graves, we started this together and although she finished before me she would never allow me to think about *not* finishing so this dissertation is also dedicated to her. Finally, I dedicate this to my husband John Schneider and my loving daughters Andrea and Deborah. They were magnificent and their love and support go beyond anything I could write on paper. I truly thank God for my wonderful family.

ACKNOWLDEGEMENTS

I would like to express my deepest appreciation to everyone who has encouraged me to never give up at achieving this goal. I cannot begin to show my gratitude.

I would like to acknowledge the work of Dr. Evelyn Fox. I read her 2002 dissertation and knew immediately that I wanted to replicate her study the Tennessee Board of Regents (TBR) schools to see how my study results would differ (or be similar) on small private liberal arts institutions that are members of the Appalachian College Association (ACA).

I would like to express my sincere appreciation and gratitude to Dr. Jasmine Renner the chair of my dissertation committee. I was very fortunate to know Dr. Renner throughout my tenure in the ELPA program. Her guidance, encouragement, and patience have been immeasurable, and I have gained a great friend through these experiences.

I would like to extend a very special thank you as I acknowledge Dr. Terrence Tollefson who served as my chair during Dr. Renner's brief sabbatical. There were a couple of times I might have given up had it not been for his patience and comforting support.

I would also like to thank the other members of my committee Dr. Terry Countermine and Dr. Catherine H. Glascock for their suggestions and advice that were invaluable to the successful completion of my study.

Last I want to extend a very special acknowledgement to my friends and colleagues who travelled this journey with me, Dr. Brenda Graves, Dr. Tony Maxwell, and Dr. Connie Wright. We made it guys!

CONTENTS

Page

Chapter Page

Chapter Page

Chapter Page

LIST OF TABLES

Table Page

Table Page

Table Page

Table Page

Table Page

LIST OF FIGURES

Figure Page

CHAPTER 1

INTRODUCTION

Information technology is becoming ubiquitous with the rapid change that continues to evolve in institutions of higher education as modern technologies have vastly increased our capacity to know and do things as well as our ability to communicate and collaborate with others. McDowell and Simon (2001, p. 2) in their book *Driving Digital* concluded that "companies led by those who don't understand the changes being brought by the Digital Revolution who don't grasp that IT—Information Technology—needs to be seen as a strategic weapon, won't be with us very long". As knowledge-driven organizations it is not surprising that advances in information technology affect higher education institutions; and there is an increasing sense that IT will have even more profound impacts in the future (Duderstadt, 1999). One of the greatest obstacles for higher education is the cost of leading-edge technologies that will meet the demands of students who are currently enrolling in our colleges and universities.

First-year students who enroll at our campuses are joining the ranks of college students with much higher technology expectations. In 2003 it was reported that 70 million American households, or 62 %, had one or more computers, up from 56 % in 2001, giving this generation more exposure to technology than their predecessors (Day, Janus, & Davis, 2005). First-year students are no longer limited to those between ages 18 and 22, instead the number of nontraditional students entering college for the first time is on the rise (Russo, Milliner-Fairbanks, & Paynich, 2006). A large number of older adults who are classified as nontraditional students continues to flood college campuses as well. According to the most recent data from the National Center for Education Statistics, 92 million adults (46%) of the U.S. adult population

participated in some form of adult education in 2001 and 73% of those adult learners were employed full-time (Shapiro, 2007).

With such diverse student populations, colleges and universities hope that investments in leading-edge technology will provide a competitive advantage that will meet the needs of every student. Over the next decade "intelligent courseware" will likely emerge as a common means of learning that increasingly relies on software approaches, leaving traditional classroom teachers to attend to issues of motivation, psychological well-being, and socialization (Duderstadt, Atkins, & Van Houweling, 2002). In order "to be effective in this era of digital competition, leaders must recognize the powerful external forces emerging from the demands for lifelong learning and the development of new learning technologies so they can identify strategies to meet these competitive challenges" (Hanna, 2,000, p. 40).

The costs associated with technology in higher education are high. In a recent *University Business* survey on Information Technology (IT) spending, 51 % of chief information officers (CIO) and IT leader respondents reported an increase in IT budgets over the prior year; while 32% reported their budgets remained the same (McClure, 2007). Figure 1 provides a graphical representation of the data and Figure 2 shows a breakdown of technology budgets by solution area (McClure). Information technology is essential to success in higher education and many educators would argue that technology is an indispensable part of the dissemination of knowledge (Fox, 2002). The challenge for institutions of higher education appears to be an ability to identify a strong relationship between having adequate funding to maintain current technology and having sufficient funding to initiate innovative technology throughout the campus community. When asked about the criteria for IT investment decision-making in a

recent study on IT funding, 67 % of the respondents reported that the primary criterion was cost (Goldstein & Caruso, 2004, p. 4).

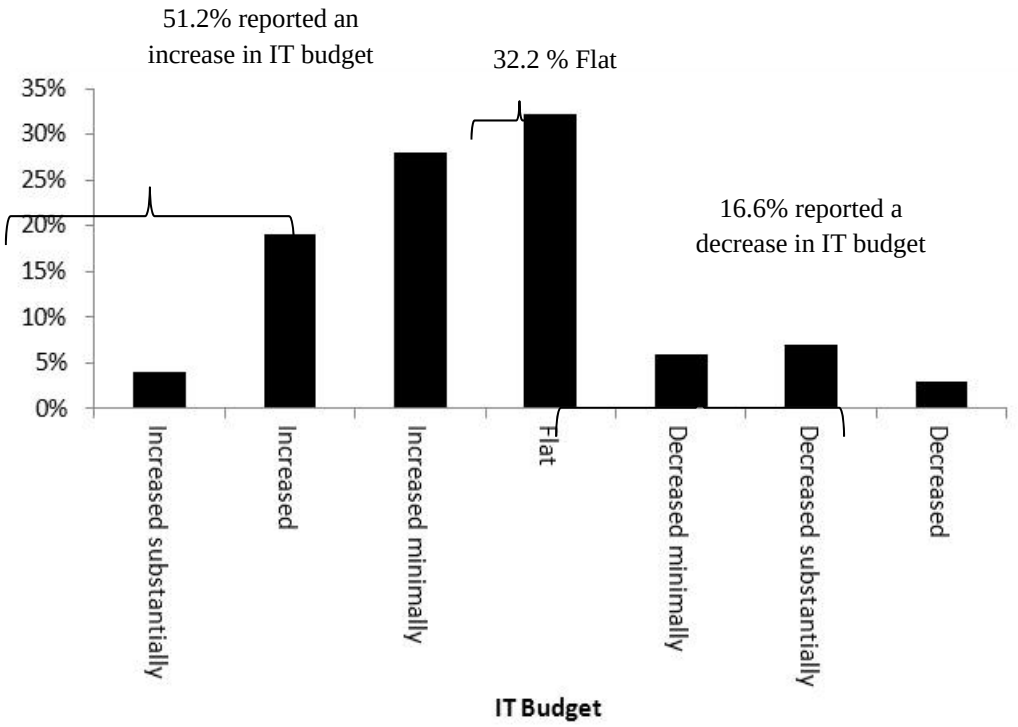

Figure 1. IT Budget: 2007 Versus 2006. Adapted from McClure, 2007.

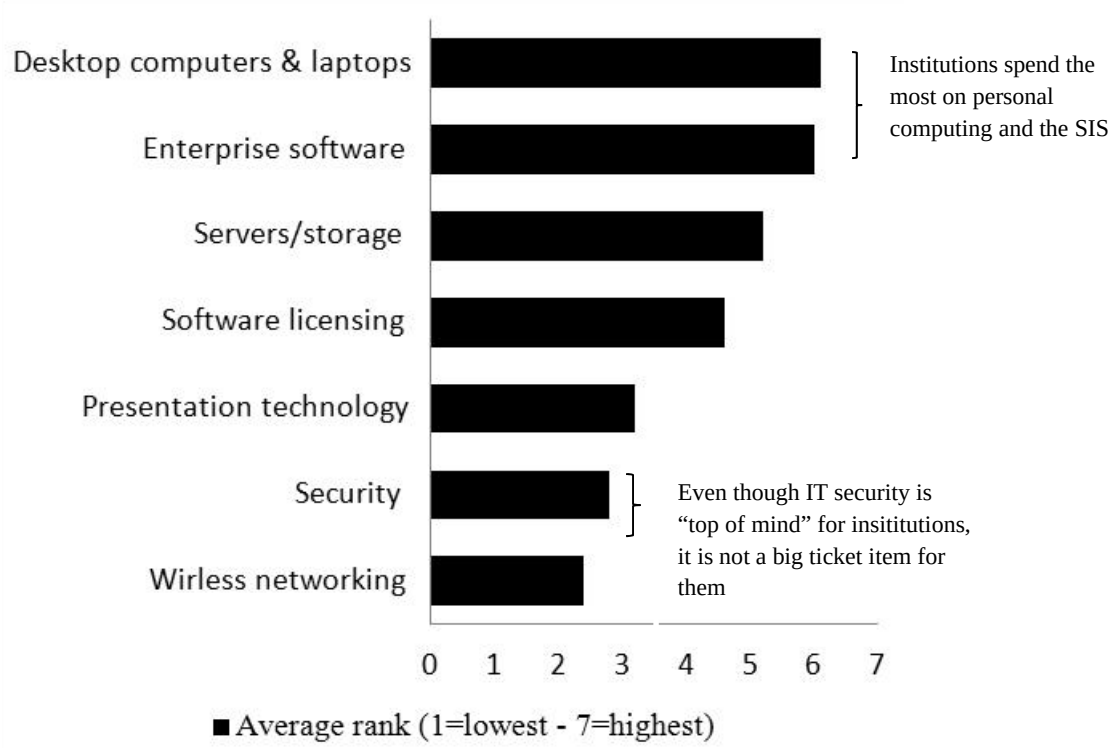

Figure 2. Institutional Spending by Solution Area. Adapted from McClure, 2007.

Strategic planning is one of the major steps an institution uses to set priorities and provide a framework for setting direction and developing a competitive edge. When institutional leaders engage in strategic planning, the participants develop a dialogue that fosters a sense of organizational ownership and belonging. Strategic planning facilitates an understanding of the institutions' vision and aims to align the college or university with its environment, allowing constituencies to participate and work together towards accomplishing goals (Kouzes & Posner, 2002). The history of strategic planning began in the military and was very popular and widespread in the business sector between mid-1960 to mid-1970, when people thought it was the answer to all the problems corporate America was experiencing (Blonin, 2004). During the past decade institutions of higher education had to confront numerous changes in their external and internal environment and respond to emerging challenges such as decreasing financial support, rapid technological advances, changing demographics, and outdated academic

programs. As a result, many universities have engaged in strategic planning as a means to make beneficial, strategic changes in order to adapt to the rapidly shifting environment (Rowley, Lujan, & Dolence, 1997).

The rise of the so-called digital enterprise has spawned a strategic means for gaining competitive advantage that exceeds an impact on the costs associated with higher education greater than we can image. Information technology is the asset capability base on which an organization constructs its critical information systems. Boar (2001) meticulously defined IT:

> …as the preparation, collection, transport, retrieval, storage, access, presentation, and transformation of information in all its forms (voice, graphics, text, video, and image). Information movement can take place between humans, humans and machines, and/or between machines. Information management ensures the proper selection, deployment, administration, operation, maintenance, and evolution of the IT assets consistent with organizational goals and objectives. (p. 25)

Huff (2000) stated "Coping with technology planning is one of the more important, expensive, time-consuming, and potentially disastrous exercises an academic institution can undertake" (p. 635). The purpose of technology planning is to direction setting, concentration of effort, consistency of purpose, and scalability for technology initiatives. McCredie (2002) in his article "Planning for IT in Higher Education" suggested an in-depth overview on an effective IT planning process, stating:

> The IT planning process helps leaders determine the appropriate roles for information technology in learning and teaching, research, outreach, and management and predicts how these roles might change over time. A well-designed planning process enables the IT organization and other campus departments to develop a shared understanding of how technology can and should support their specific programs. (p. 15)

A number of complex factors are involved in planning for technology. Limits on performance, breakthrough technology, market competition, economics, and changing needs all play a part and must be watched closely when developing a technology plan (Strong, 2007).

The IT strategy must fit into the broader institutional strategy. Aligning technological planning to the strategic plan assures an institutional ability to anticipate, recognize, and adapt to change. Alignment of technology plans with organizational objectives continues to be among the top concerns reported in surveys of information management executives (Reich & Benbasat, 2,000). For an information technology (IT) organization, "proper positioning" within an institution has become inherently more important as technology has emerged as a common thread in collegial and institutional activities (Pirani & Salway, 2004). Alignment can be difficult to achieve in higher education. The challenge is to align organizational plans, investments, priorities, and actions with institutional priorities originating from the leadership (Pirani & Salway). The constant technological evolution further complicates the alignment process. An institution must have a strong institutional vision and if the technology plan is not aligned to the institutional strategic plan then the vision is not necessarily accurate. The technology plan must come out of a shared thinking and consensus of the entire institution. The process must involve the right participants in order for the technology needs to be communicated effectively among the stakeholders (Savarese, 2004).

Statement of the Problem

This quantitative study was designed to determine the answer to the question regarding the role of technology driven strategic planning in small private liberal arts colleges and universities from Appalachia. One of the greatest challenges that colleges and universities face today is the need to ensure financial balance between technology strategies and business objectives. My review of literature indicated that significant data existed on both strategic planning and technology planning in higher education; however, data on how colleges and

universities are aligning the two strategies are not as readily available. Current literature indicated that some progress in aligning technology initiatives to business objectives in larger public colleges and universities has been documented, but very little evidence was found that studies have been conducted for small private institutions.

Given the financial burden that technology can place on a small private college or university, it is critical that academic leaders understand the necessity for technology planning that supports strategic planning. Communicating technology needs throughout the campus effectively will strengthen the institution financially as well. How do they determine what technology is needed? How do they know with confidence that the technology needed will support the vision, mission, and business objectives of the institution? The purpose of this study was to determine whether the technology initiatives were appropriately aligned to institutional strategic plans and whether these planning documents were used effectively to communicate technology needs in the Appalachian College Association (ACA) institutions.

The ACA is a nonprofit consortium of 35 private 4-year liberal arts colleges and universities spread across the central Appalachian Mountains in Kentucky, North Carolina, Tennessee, Virginia, and West Virginia. Collectively these higher education institutions serve approximately 42,500 students. The ACA helps develop and share ideas, information, programs, and resources to achieve its goals, which includes promoting cooperation and collaboration among its member institutions to serve the people of Appalachia through higher education. While the advent of technology, primarily the Internet, has leveled the playing ground for many of these small institutions, it is their ACA membership that has allowed them to leverage their power of influence cooperatively. The ACA developed from a grant-funded project at the University of Kentucky over a 10-year period beginning in 1980. In 1990 the ACA became an

independent organization, with its own tax-exempt classification under Section 501(c)(3) of the 1986 Internal Revenue Service Code. The ACA's purpose is exclusively educational and governance is by a board comprised of member college presidents and an executive committee (ACA Website, 2009).

Research Questions

This study addressed the following research questions:

1. To what extent is technology a part of strategic planning in institutions that are members of the ACA consortium?
2. To what extent are faculty administrators involved in planning for technology in institutions that are members of the ACA consortium?
3. To what extent are staff administrators involved in planning for technology in institutions that are members of the ACA consortium?
4. To what extent are information technology leaders involved in strategic planning in institutions that are members of the ACA consortium?
5. To what extent do institutional budget considerations align with strategic planning for technology in institutions that are members of the ACA consortium?

Assumptions

While several definitions for planning exist, there is no known standardization in planning terminology within the population. The study made the following assumptions:

1. Participants responded in an honest manner.
2. Each institution had a mechanism for strategic planning, technology planning, or both.

3. Participants were knowledgeable about technology and strategic planning in their institutions
4. Each of the institutions used technology for both academic and administrative information technology as defined in the definition section of this document
5. Data collected within Zoomerang (an application software package) were not altered in any way.
6. Survey by Zoomerang provided an accurate and secure method of collecting web-based survey results.

Significance of the Study

There is significant literature pertaining to both strategic planning and technology planning. Some research is beginning to surface related to aligning technology with strategic planning. This study will contribute to the body of literature that has not been addressed; specifically, the alignment of strategic technology initiatives with institutional strategic planning initiatives.

The member schools of the ACA do not have a set of guidelines or a clearly defined structure for technology planning or strategic planning specific to each institution instead each institution is independently governed. This study may be used to provide direction, insight, and guidelines and would be useful to determine the strengths and shortcomings for each institution. It is significant in that it will reveal whether the ACA member institutions produce technology initiatives that are appropriately aligned to institutional strategic plans and whether these planning documents are used effectively to communicate technology needs on their campuses.

Limitation and Delimitations

This study was limited to the colleges and universities that are participating members of the ACA consortium. Only faculty and staff who are members of the ACA institutions and who served in leadership position such as academic officer (VP) or first level academic manager, administrative officer (VP) or first level administrative manager, chief information officer or first level IT manager, chair/coordinator/dean/director (reporting to a first level manager) or second level manager participated in the study. This study was limited in scope by considering the variation in the methodology, documentation, and participation among the ACA institutions in the strategic planning and technology planning process.

My role as an IT director for one of the participating ACA institutions also poses some limitations in this study. As an IT director I have participated in numerous ACA functions that have allowed me an opportunity to collaborate with peer IT leaders. On many occasions such opportunities provided me personal insight on many of the topics of research covered in this study.

Definitions of Terms

Assessment — in this study assessment refers to: "a critical tool for decision makers; used to consider the types of questions presidents, provosts, CIOs, deans, and department chairs must address; examples include: is the quality high enough; does the investment make a difference; where should we commit resources to be most beneficial; is this program successful or viable; how are our resources being used; what are the best strategies to improve student learning; and how we compare to others" (Stewart, 2002, p. 2).

Faculty or staff administrators – in this study faculty or staff administers were faculty or staff members who served in managerial roles, faculty administrators were either school deans or department chairs; staff administrators were either department managers or directors. Faculty or staff administrators usually had budget officer privileges and were responsible for their departmental budget.

Information technology (IT) — the preparation, collection, transport, retrieval, storage, access, presentation, and transformation of information in all its forms; voice, graphics, text, video, and image (Boar, 2001).

Leading-edge technology — is: "any software and hardware that provides the ability to do what is requested faster than ancient methods of conducting things, such as e-mailing versus writing, messaging three people versus buying a 3-way calling package, digital research versus traveling to a well-stocked library, et cetera—Lindsey Alexovich, Senior, American University" (Roberts, 2005, p. 3.2).

Planning process — the methods and procedures used to develop the strategic plan and the technology plan make up the planning process.

Stakeholders — Nuseibeh and Easterbrook (as cited by Boutelle, 2004) defined stakeholders "as individuals or organizations who stand to gain or lose from the success or failure of a system" (p. 2); in higher education, these are the students, faculty, staff, administrators, and board members.

Strategic alignment — occurs when the institutional strategic plan is in a state of alignment, so the institutional goals and objectives naturally and harmoniously work together to accomplish a common end; this happens when they perfectly complement and reinforce each other (Boar, 2001); "a process of ensuring that all business functions operate in harmony with each other to support the strategies of the business" (Boar, 2001, p. 143).

Strategic plan — Volumes have been written on strategic planning, but for the purposes of this study the following definition best suits the objectives of this research. Strategic planning helps an organization identify and maintain an optimal alignment with the most important elements of its environment and is designed to produce fundamental decisions and actions that shape and guide what an organization is, what it does, and why it does it (Sevier, 2001, p. 39).

Technology — for the purposes of this research, technology is different from information technology and is defined as the infrastructure (wires), the hardware (computers, servers, etc.), and software that are used to support the academic activities including business processing (payroll, accounts payable, student information, and communication-electronic, and voice) as well as instruction processing (online learning, classroom presentation, and video conferencing).

Technology plan — A technology plan is the single most important ingredient for effectively using technology. The technology planning process maximizes the effective use of technology and minimizes technology crises. Effective institutional technology planning begins with a vision for student learning, a statement of beliefs, and a rationale for creating and continuing to build a network of learning environments. It culminates with benchmarks and timelines for accomplishing institutional learning goals, long-term funding strategies, and accurate measures for assessment and evaluation (TechSoup Website, 2008).

Overview of the Study

Chapter 1 provides an introduction to the study and includes the statement of the problem, research questions, limitations, and delimitations. It also includes the definitions of terms and provides the basic organization of the study. This research was grounded in the themes of the literature reviewed in Chapter 2. The literature review focused on five key areas

that supported the study. The five areas of review included: 1) higher education in the digital age; 2) managing technological change; 3) strategic planning versus technology planning; 4) aligning the technology initiatives with the strategic plan; and 5) balancing the money equitably.

Chapter 3 describes the methodology that was used to conduct the study. Also included is a description of the research design along with a description of the sample population and data collection. Information was gathered using a questionnaire that was developed and administered electronically to each of the invited participants from the member institutions. This chapter includes documented hypotheses and the data analyses that were analyzed using quantitative statistical methods. Chapter 4 provides presentation and analysis of the data collected and Chapter 5 contains a summary of the findings, conclusions, and recommendations resulting from the study.

CHAPTER 2

LITERATURE REVIEW

Introduction

Chapter 2 reviews applicable literature on strategic planning, technology planning, and the process of aligning theses plans to influence strategic initiatives in higher education. Effectively using technology in higher education has the capacity to enhance and enrich teaching and scholarship, but it can pose threats because technology is not always high on the planning agenda in our colleges and universities (Duderstadt et al., 2002). The review is structured into five major categories divided into 13 sections and begins with a background of higher education in the digital age. The next four sections outline and present information on strategic planning and technology planning with an emphasis on how it relates specifically in higher education. There are two sections that discuss leadership and learning with technology. The following three sections discuss the process of aligning the technology plan with the strategic plan in order to achieve and communicate technological strategic initiatives within the campus infrastructure. The final sections of the literature review include a discussion on financial stability that can be achieved by appropriately integrating the budgeting processes into the planning models.

Technology encompasses many disciplines and professional fields in higher education. Although this diversity can lead to an exciting variety of perspectives, it can also produce conflicts in philosophy and differences in terminology including huge variations in the types of technology chosen and implemented (Johnson, Lamb, & Teclehaimanot, 2003). The potential for using technology to support teaching and learning is exploding. I am the Director of Academic Computer Support at Lincoln Memorial University and over the last 10 years I have

seen faculty and students migrate from a culture of synchronous face-to-face learning void of technology to a culture of electronic asynchronous learning using Email and threaded discussion as critical tools for learning. Adaptation to technology is a necessary tool that requires a framework for planning the strategic use of technology that will support the institution's mission (Podolsky, 2003).

Strategic planning in an institution has the potential to transform it, reengineer it, and even make it into a force that leads other institutions instead of following them (Hunt, Stevens, Loudon, Oosting, & Migliore, 1997). It is one of the most all-encompassing management activities in higher education. Colleges and universities have been described as highly charged political environments where no one is shy about expressing opinions, so leaders often avoid making hard and unpopular decisions (Sevier, 2001). In a recent study on strategic planning between 2- and 4-year colleges it was noted that the need for strategic planning in higher education has intensified because of severe resource constraints and increased accountability from both internal and external agencies (Welsh & Nunez, 2005). With increasing and competing stakeholder demands, it is neither possible nor acceptable for universities to drift along without a clear focus – deliberate decisions must be taken to steer the institution in a particular direction (Cowburn, 2005).

Technology decisions are ubiquitous! A decision to purchase and support personal computers (PC) versus Macintosh (MAC) computers seems simple and inexpensive, and the decision regarding whether a laptop is more cost effective than a desktop will always frustrate technology decision makers. Such questions as "Should we invest in wireless technology: is it crucial to the students' academic success or is it a competitive recruitment strategy?" and "Can we survive without it?" can lead to costly financial mistakes. When information technologies and

resources pervade our institutions, the interrelationships among campus citizens and capital resources form a crazy quilt that befuddles analysis and decision making (Katz, 1999). The technology strategies stimulate even more challenges when one considers the instructional needs of face-to-face teaching to online or technology-enhanced courses (Milam, 2000). All of these decisions affect critical areas that are rooted within the strategic plan of any institution regardless of whether they are written or assumed. Technology planners often experience difficulty connecting technology infrastructure with the effective leadership skills needed for students, faculty, and staff to benefit from technology. Huff (2000) in his study "Colleges and Universities Survival in the Digital Age" stated that in order for technology planning to be successful the exercise must have been broadly understood within the community as something that contributed to the institutional mission. It is crucial that technology planners work effectively with the president, provost, and other executive officers to create and sustain an IT governance structure for the entire college or university (Penrod, 2003). Faculty members of colleges and universities in the 21st century may find it necessary to set aside their roles as teachers and become designers of learning experiences, processes, and environments (Duderstadt, 1999).

Higher education institutions need a vision that includes measurement and evaluation. A university plan must combine the aspirations of academic departments with the global purposes of the entire institution (Cowburn, 2005). In her article Cowburn offered detailed information on why colleges and universities plan when she stated that:

> Knowing more about one's strengths and weaknesses allows a certain amount of scope for adapting the external environment to suit the institution rather than being forced to fit into the existing environment. Decision-making processes must be robust enough to ensure that where opportunities arise they are carefully considered and, if they fall outside the institution's broad objectives, rejected. (p. 108)

Planning is the ability that is stimulated by the human desire to better a situation. In higher education bettering one's condition includes hiring better faculty, recruiting stronger students, upgrading facilities, strengthening academic programs and student services, and acquiring the resources needed to accomplish these things (Dooris, Kelley, & Trainer, 2002). To summarize colleges and universities plan in order to create an alignment between their daily activities and their environment, an alignment that facilitates the flow of resources within the institution (Sevier, 2003). It is critical for higher education to give thoughtful attention to the design of institutional processes for planning, decision making, management, and governance (Duderstadt et al., 2002).

"Emerging technologies are modifying the relationships between instructors and students, making the determination of quality teaching in higher education more complex and difficult" (Hartman, Dziuban, & Brophy-Ellison, 2007, p. 68). If colleges and universities hope to use technology successfully for teaching, more than minor adjustments in current practices are required (Bates, 2000). It is critical that the planning process encourages key stakeholders to get involved in each aspect of the decision-making process. Achieving meaningful technological transformation requires institution-wide, systemic initiatives involving input and assessment from a large number of faculty members and administrators (Hartman, 2008).

In order for a strategic plan to be effective educational units must continually monitor their strategic plans to ensure they are aligned with the realities of their institution (Dowie, 2002). Successful strategic planning is dependent upon broad-based support and participation by institutional stakeholders. Tromp and Rueben (2004) concluded in their "Strategic Planning for Higher Education (SPHE)" model that:

> Plans fail for all sorts of reasons, but more often than not, problems arise from deficiencies in the planning process, rather than in the plan itself and those breakdowns in the process can often be attributed to shortcomings in leadership, communication, or assessment. (p. 7)

In their book *Strategic Planning for Nonprofit Organizations* Allison and Kay (2005, p.6) provided four points they called keys for effective strategic planning:

- Focus on the most important issues;
- Be willing to question the status quo and sacred cows;
- Produce a document; and
- Make sure the strategic plan is translated into annual operating plans.

Finally, Katsioloudes (2002, p.19) summarized an effective strategic plan as "the implementation of strategy and without successful implementation, an organization's strategy is really nothing more than a fantasy".

Planning for technology can be difficult because there are so many choices to support the different technological uses in academia. Implementing new technology in higher education is so much more than just buying computers (Bates, 2000). Duderstadt (1999) in his article "Can Colleges and Universities Survive in the Information Age?" stated that:

> Perhaps the most critical challenges facing most institutions will be to develop the capacity for change; to remove the constraints that prevent institutions' from responding to the needs of rapidly changing societies; to remove unnecessary processes and administrative structures; to question existing premises and arrangements; and to challenge, excite, and embolden all members of the campus community. (p. 1)

These challenges set the tone for the change that is necessary to bridge the gap between technology planning and strategic planning. Ignoring the need to make technology planning an integral part of the institutional planning processes would be like ignoring the traditional need to

plan for space, library holdings, and staffing when deciding to implement a new academic program (Foster & Hollowell, 1999).

The process of technology planning and strategic planning is prevalent in higher education today; however, the ideal of aligning the two plans together with the budgeting process continues to be a challenge (Higdon, 2006). According to Oblinger (2008) the value of information technology is predicated on how well it supports the institutional mission. I have experienced first-hand the financial growth associated with technology as I watched our institutional technology budget grow from $100,000 to over $3 million over a period of 10 years. Dooris et al. (2002) in their literature review and consultation with knowledgeable colleagues concluded that a convincing, empirical study on the efficacy of strategic planning in higher education had not yet been published.

It is essential that colleges and universities understand that there are essential costs associated with using technology and that these costs can be very high. In a recent study on the cost analysis of online learning, Milam (2000) from the University of Virginia stated that institutions were not prepared to do the type of activity-based costing models that are necessary to understand the costs associated with technology-based teaching compared to traditional learning. Milam's research also suggests the need for a cohesive planning process and better resource allocation models (p.1). It's not until a technology-based course increased to over 40 students per course over a 4-year period that a technology-based became more cost-effective than a face-to-face course (Bates, 2000). Information technology professionals are not alone as they face the challenge of where to direct their attention. There are so many technologies to choose from and so many ways to use them, most institutions find there is not sufficient time or

methods of assessment to determine whether the introduction of the new technology is having any impact on student learning before a new technology surfaces (Hartman, 2008).

In order to assure adequate funding for information technology, it is critical to ensure a balance in investment among key institutional strategies including technology. The primary reason for planning is to align technology with institutional goals and priorities. In a recent *EDUCAUSE* study 76% of the academic respondents identified IT alignment as a top reason to engage in strategic planning, and 74% said that IT planning had a considerable impact on the level of strategic alignment (Pirani & Salaway, 2004). While technology strategies associated with technological infrastructure are absolutely essential, it is often the only IT strategy adopted by many colleges and universities (Bates, 2000). Bates further elaborates that most institutions envision technology expenditures as a once-only capital investment often supported through grants or some other elusive money source. Colleges and universities must pay close attention to effectively maintaining a financial balance between technology strategies and institutional strategies. As technology grows into a fundamental tool for teaching and learning it becomes considerably strategic to the overall success of the institution. The kind of transformation required for any institution to survive and thrive requires enterprise wide commitment to and support of information technology goals (Turner & Perry, 2002).

This chapter contains a review of books, journal articles, and the Internet on these associated topics. Examination and review of departmental websites from several colleges and universities also contributed to the content in this chapter. Literature review research came from library resources at both East Tennessee State University and Lincoln Memorial University. Both online material and printed reserves support the research. This research builds on the study by Evelyn Fox that was presented to the ETSU faculty in May 2002. In addition several

EDUCAUSE studies on strategic planning and technology planning were cited throughout Chapter 2 in support of this study. The EDUCAUSE studies were conducted on larger public colleges and universities. Widespread studies conducted on small private colleges were not available.

Higher Education in the Digital Age

The U.S. higher education enterprise incorporates roughly 4,314 colleges and universities serving the diverse educational needs of our 17,758,870 students (Chronicle of Higher Education Almanac, 2008). The use of technology is increasing in flexibility and its integration into every part of higher education. Colleges and universities rely on technology for both administrative and academic operations. Most colleges and universities are looking for ways to control costs and increase productivity only to find their current organizations and governance makes this very difficult (Duderstadt, 1999). Just what do we need to know about technology in order to survive in this digital age? Information technology has crept into our lives over a brief period with little warning and essentially no formal educational preparation (Lin, 2002). As our nation has shifted from an industrial to an information economy, traditional higher education no longer meets the full needs of our society (Levine, 2001). Today, whether designing the information architecture of a single Web-based course or planning a campus-wide streaming video project, the goals of technology are strongly connected between multiple campus departments (Johnson et al., 2003).

Higher education continues to experience change driven by information technology, and although this technology has the capacity to enhance and enrich teaching, it also poses certain threats to our colleges and universities because powerful computers now have the potential to deliver educational services to anyone, anyplace, anytime (Duderstadt et al., 2002). Change can

be intimidating and higher education faces a dynamic tension caused by integrating technology into the deep-rooted philosophies of higher education that creates challenges for faculty, students, and administrators (Leach, 2008). In order to remain viable and competitive a college or university must create and maintain academic and administrative systems that keep pace with technological change and, most important, support the mission and key institutional goals and objectives (Turner & Perry, 2002).

The growth and sophistication of technology during the last several decades has been unprecedented, and there is no indication that the growth and increased sophistication in technology over the last several decades is going to decrease (Rice & Miller, 2001). Many colleges and universities are undertaking campus-wide initiatives to supply universal access to computers and create additional dynamic teaching environments that enhance the educational experience (Pitocchelli, Chakrin, & Murphy, 2000). Funding information technology in higher education is one of the top issues facing institutional executives, and reducing IT costs and obtaining adequate funding are major concerns (Goldstein & Caruso, 2004). Technology has the potential to make higher education institutions more efficient. Students are demanding greater and more productive access to computer-enabled educational resources and higher education institutions are responding by implementing programs that help ensure all students have access to computers configured for their computing environment ((Pitocchelli et al., 2,000). According to a 2004 study by Own and Demb students arrived on campus with the expectation that technology would play a major role in their education, and they demanded better service, higher quality, and a mix of products that satisfies their definition of a good education. Using technology during the academic learning process apparently has helped students develop the

technical skills necessary for life-long learning while preparing them for success in today's technology-driven workforce (Foster, 2004).

The integration of technology into all aspects of the academic workflow has resulted in a significant shift to where and how work is accomplished. The consequence of this integration is that almost every person on campus is now exposed to some activity that requires using technology in his or her work, studies, or basic communication (Turner & Perry, 2002). This exposure to technology and the explosion of the Internet stimulates new stakeholders to seek and experiment with different technologies to accomplish similar tasks.

The Influence of Technology on Higher Education

Available access to technology reduces the impact of some of the barriers to education that today's student faces. Technology expands opportunities to market educational programs for older or working adults and opens the higher education market to new providers: corporate universities, for-profit institutions, and technology-based distance providers (Owen & Demb, 2004). The competitive edge that was once limited by bricks and mortar is gone. Educating today's life-long learner is much more competitive and is no longer limited to traditional colleges and universities (Johnson et al., 2003). Russo et al. (2006) reported that:

> In addition to the 17 million students counted by IPEDs (the data system that tracks students attending Title IV eligible institutions), there are another 85 million that are involved in other forms of postsecondary learning -- much of it corporate training that could, but doesn't, go to university continuing education departments.

In order for today's college or university to thrive in the age of technology, a campus-wide commitment to the support of information technology goals and objectives is required (Neal & McClure, 2003). New technologies are profoundly affecting teaching and learning, creating new

opportunities, and nurturing new competitors in the world of distributed learning (Hawkins & Marcum, 2002).

Colleges and universities must continue to take the lead in preparing students to enter the workforce. Technology skills are increasingly important in every industry segment outside the world of higher education. Individual faculty members must get involved in evaluating their curriculum to assure that adequate technology skills are included, but it can be extremely frustrating for them to plan on new technologies only to find the infrastructure and budget dollars do not exist to support their efforts (Agee & Zenelis, 2002). New curricula requiring the use of technology requires planning that includes how the institution plans to support students and faculty who are going to use the technology (Agee & Zenelis). If colleges and universities are successful in adopting technology for teaching and learning, they most focus on changing the way their institutions are planned, managed, and organized (Bates, 2000)

The biggest barrier to an increased use of technology is the difficulty of thinking creatively and imaginatively about how technology could move a department, college, or university forward in a strategic sense (Bates & Poole, 2003). The explosive development of technology in higher education also brings new leadership challenges. Leadership at all levels in our colleges and universities must embrace the consequences technology challenges will have on institutional leadership. In order for our colleges and universities to be successful, the leadership teams at all levels, including student leadership, must engage technology as active participants (Pitocchelli, Chakrin, & Murphy, 2000).

Technology Trends in Higher Education

Rapid advances in technology continue to redefine what is possible today. IT professionals who were once responsible only for technological issues involving infrastructure and software now find they are joining other academic leaders as they contend with legal issues, legislative relationships, and economic competitiveness (Oblinger, 2008). The path to teaching and learning with technology is a continuous journey along a super highway that intersects with the primary institutional strategies–financial, instructional, and administrative. As we look to the future we see fundamental shifts that are moving us toward the emerging "global" university that can serve as a lifelong resource for alumni or a strong economic-development partner for the community. The future influence of technology at the institutional level is no longer limited to the faculty, staff, and students.

The convergence of disruptive technology forces often redefines the role of higher education. Today's students want to take content from other people outside of the institutional infrastructure and use it in new and creative ways (Hilton, 2006). As the demands from students and faculty continue to grow the real IT issues are no longer just about products; instead, they are about the effective delivery of technology services and how these tools can aid and advance academic learning strategies (Green, 2006). Most college students are motivated by the use of technology in their curriculum. Videoconferencing technologies allow students to interact with experts both on and off campus (Oblinger & Hawkins, 2006). Podcasts, Wikis, and Blogs are interactive services that students use routinely to disseminate academic information (McGee & Diaz, 2007). No one can predict the future with accuracy that technology will take, but one can be sure that advances in Internet products like the Web 2.0 project will be in the mix (Vonderwell, Zachariah, & Franklin, 2008). The information and communication resources of

the Internet are a critical part of the academic infrastructure and are indispensable to research and education but not without cost. The technology services and tools that enhance the quality of the student experience and extend education beyond the campus carry a potentially significant price as the potential for manipulating and exploiting technologies commonly used by universities and colleges increases.

Securing computer networks and campus data has emerged as a high priority among educational institutions. Since the beginning of 2008, at least 30 U.S. universities and colleges have experienced data breaches either from computer theft or from inadvertent exposure of personal information on the Internet (Wilen-Daugenti & McKee, 2008). The increased use of Internet technologies, applications, and smart services drives the need for network management tools that cross into data security and privacy compliance areas (Schaffhauser, 2009). The need for academic institutions to adopt innovative solutions requires powerful, reliable, expandable, and secure IT infrastructures that have adequate bandwidth, quality of service, and storage to sustain innovative solutions that will change the way students learn, communicate, produce, collaborate, and study both on and off campus (Wilen-Daugenti & McKee). College and university planners must develop, implement, and analyze the planning processes that are necessary to ensure success in meeting their current and future technology needs.

Understanding Strategic Planning and Technology Planning

Because technology is moving at a rapid pace institutions are rethinking how they should collectively approach planning. McDowell and Simon (2001, p. 57) state, “Any business plan that is not based on technology isn’t a plan, it’s an illusion”. Colleges and universities present unique challenges for strategic planners given the lack of clear-cut incentives and the array of

institutional subcultures that see themselves as having a stake in the planning process (Strategic Planning, n.d.). Strategic planning in higher education involves making choices that are critical to institutional success. According to Allison and Kaye (2005):

> …strategic planning is a systematic process through which an organization agrees on—and builds commitment among key stakeholders to—priorities that are essential to its mission and are responsive to the environment. Strategic planning guides the acquisition and allocation of resources to achieve these priorities. (p. 1)

Edge (2004) the VP of Strategic Planning and Marketing at Datatel, Inc. defines strategic planning as:

> …the process of determining a company or an institution's long-term objectives; and identifying the best approach to achieve those objectives. It is a continual improvement process that monitors performance against goals, analyzes achievements and shortfalls and adjusts activity to accomplish the desired results. (p. 40)

Colleges and universities engage in strategic planning that is influenced by a range of obstacles including an increasing demand for higher education that is plagued with a decline in available funding, changes in student demographics, and a need to compete with emerging models of higher education while focusing on the essence of a traditional university (Blonin, 2004). Strategic planning can be an effective management tool in the midst of uncertainty and constant change. It is important that academic planners recognize that all methods of planning are essential for achieving institutional success.

Technology planning in higher education requires vision, cooperation, collaboration, and funding. In order to plan for technology, academic planners must understand that the real impact of digital technology is on basic human processes such as work, play, learning, collaboration, and decision-making (Duderstadt et al., 2002). Technology planning yields results when the planning process involves people working aggressively as part of a collective group using well-

defined process to accomplish vision and mission goals that have been built through proactive collaboration (Greer, 2006). The methods an institution uses to conduct planning influences governance and decision-making. If the institutional culture is one of mistrust, building a good IT governance and decision-making structure can be difficult (McClure, 2003). The significance of technology is too great and the opportunities for ill-informed technology decisions happen too frequently for IT planning to be left without governance. Foster and Hollowell (1999) state the three constructs that are fundamental to planning and budgeting for information technologies are leadership, quality of resources, and quantity of resources. An even greater consequence is the impact on student learning and an increase in the cost associated with technology initiatives developed in a poor planning environment (Penrod, 2003). Information technology planning requires a broad approach that begins with the question, “What do we want to do with technology?" (Cavalier, 2002, p.4). In his 2002 article Cavalier acknowledged that IT strategic planning ranked seventh in importance to an institution's strategic success and second as the issue that IT leaders or administrators are spending most of their time addressing.

The Strategic Planning Primer

All organizations do at least some planning even if it is largely informal and possibly largely unintentional (Hunt et al., 1997). Planning alone does not produce results, instead a good plan must be implemented in order to achieve desired results, and a well-developed plan has a much better chance toward affecting these desired outcomes (Penrod, 2003). Rowley and Sherman (2001) also indicated in their study on strategic implementation that although there are a variety of reasons for this the fact remains that many campuses go through a time-consuming and often an expensive and disruptive process of developing a strategic plan only to see it

shelved and ignored as anything truly useful (Rowley & Sherman, 2001). Rowley and Sherman further explained that "Evidence suggests that this is not particularly a problem of individuals on a campus killing a process they resent or fear (though in some cases, this is true), it is much more a problem of having an implementation strategy that will successfully put the plan into motion" (p. 3).

It is critical that the planning process include all the constituencies that will be affected and that all stakeholders' opinions are valued, respected, and addressed from the very beginning (Higdon, 2006). Sometimes the planning process only involves a select group of participants and unfortunately this select group does not always represent the diversity throughout the institution (Neal & McClure, 2003). Effective strategic planning encompasses a range of stakeholders that will guarantee equal representation of all institutional units. When all of the initiatives are not included in the strategic planning process and when key stakeholders are excluded a culture of "have and have nots" emerges (McClure, 2003). Once the leadership team is assembled it is important to make sure they are fully engaged in the planning process. A compelling direction and winning strategies, not detailed operational plans should be the outcomes of a well-designed strategic planning process (McCredie, 2000).

The Art of Technology Planning

A technology plan is a communications tool used to provide a framework for improving the effectiveness in an organization, a document that aligns the use of technology with the strategic goals of the organization (Podolsky, 2003). Penrod (2003) references four crucial factors for creating a successful IT vision:

1. CIO membership in the cabinet

2. IT governance structure that fits the campus culture

3. IT planning process linked to performance, budget, and the institutional strategic plan

4. Organizational learning initiative that informs IT constituents of the accomplishments that will move the institution toward its overall goals

Steve Gilbert the president of the Teaching, Learning, and Technology (TLT) Group, an organization founded in 1998 that is committed to supporting teaching and learning with technology. In 1995 during his affiliation with the American Association of Higher Education (AAHE) he wrote a short article that included a powerful summation of how involved stakeholders must be in the technology planning process. His words ring loud and clear and they are still practicable today, the relationships among stakeholders when planning for an institutions success are critical to that success.

> Most significant new applications of information technology cannot be integrated widely and effectively within a college or university without both the commitment of the institution to the relevant infrastructure and the commitment of many individual faculty members to the particular approach. Faculty members will not succeed with these new approaches with the kind of information and help that can be provided only by a combination of the services available from the library, academic computing, faculty development, the bookstore, and together campus organizations. This same combination of groups must be represented in the development of an effective strategic approach to the infusion of information technology into the academic life of the institution. (p. 47)

If the planning processes for strategic initiatives and technology initiatives involve the necessary personnel the success of an institution's planning will be directly proportional to the support the plans receive when they are implemented (McCredie, 2000). Defining a leadership team that will foster a good culture for technology planning requires selecting the right representation. Bates (2000) suggests it is critical to have an academic technology advisory committee that should include:

- Representative faculty members, some of whom should have extensive experience in using technology for teaching;
- A dean or two;
- The director of the teaching and learning center;
- The librarian; and
- The person responsible for the technology infrastructure. (p. 195)

The technology leadership needs to understand that his or her role should be more of a generalist instead of a specialist, acting and participating as a critical partner in the central administration of the college or university (Hawkins & Marcum, 2002).

Why Colleges and Universities Plan

Constructing an effective strategic plan for an institution of higher education can be a difficult task. A number of external forces motivate colleges and universities to participate in the strategic planning process. Most accrediting agencies require colleges and universities to develop and assess annually a strategic plan that includes the institution's major initiatives. In an effort to satisfy the many accrediting organizations colleges and universities have attempted to adapt the traditional strategic planning processes used by the corporations and the business industry. Institutions of higher education do not fit the same mold as the business industry so much of the traditional methods for strategic planning in higher education are not successful.

> Compared to corporations, universities are "organized anarchies" or "loosely coupled systems" that do not follow principles of coordination and control applicable to a corporation. The structure of the organization is flat (i.e., there are few levels in the hierarchy), the work is fragmented, the technology is soft, the participants are fluid (i.e., students, staff, and faculty come and go), and the goals are necessarily vague. The upshot, according to Burton Clark, is that universities have a "natural ambiguity of purpose." To treat them otherwise is to risk destroying their special character (Referenced in the University of Iowa Strategic Plan 2,000).

Often a college or university embraces the concept of strategic planning for the wrong reasons, sometimes attempting to fit academic services into the traditional for-profit model. It is critical for higher education to give thoughtful attention to the design of institutional processes for planning, decision-making, management, and governance (Duderstadt et al., 2002).

Technology has not decreased the cost of education, on the contrary, the rapid need to purchase new technology and pay a new and emerging workforce to support it continues to generate tension and turbulence in the financial planning and funding allocations in higher education (Owen & Demb, 2004). When technology is used in industry other than higher education, the funding can easily be justified using measureable return on investment (ROI) where the technology often pays for itself because of an increase in productivity (Stewart, 2002). Colleges and universities have not yet developed the appropriate mechanisms for measuring ROI, especially when technology initiatives cross multiple disciplines (Stewart). Planning for and incorporating technology into the strategic planning process compels academic administrators to establish values for determining appropriate ROI for technology implementations.

The Planning Participants

The methods used to determine which stakeholders are required to participate in the planning process can get complicated in colleges and universities. Each institution has decision-makers who play a pivotal role in pushing technology plans forward or making them grind to a halt, unless such people are included in the planning process effectively the process can be crippled (Huff, 2000). Stakeholders in all fields of study need to understand how technology affects policy, day-to-day business, and teaching and learning. Colleges and universities are

notably decentralized, making the planning process decentralized as well (Grush, 2004). Effective technology planning processes need to build on the academic vision of the major issues that challenge them. It is important for academic administrators to collaborate with IT professionals in order to inspire and develop deeper collaboration that can reduce gaps and overlaps in technology throughout the campus (Higdon, 2006).

In order for the IT planners in higher education to deliver value to the rest of the college and university communities, they must develop a culture of service that permeates the entire institution (Beeby et al., 2006). Future IT leaders will need their technical skills, but they will also need skills associated with marketing, communication, budgeting, innovation, management, leadership strategy, and vision (Gould, Unger, & Bacon, 2008). The last 15 years have seen the creation of a new senior-level position in most college and university administrations—the chief information officer (CIO) (Penrod, 2003). The role of the CIO leadership position is to create and sustain this IT governance structure for the entire college or university.

Current research indicates that technology in higher education can be categorized into two distinctive areas of influence; administrative computing and academic computing. Most small private colleges and universities have one centralized IT department that supports both (McCredie, 2000). Academic faculty are much more concerned with the instructional technology initiatives and have a strong desire to have input in the decision-process for developing these initiatives. In their study "Faculty Involvement in Planning for the Use and Integration of Instructional and Administrative Technologies" Rice and Miller (2001) state that faculty have historically staked a claim to college governance in academic areas like course design, curriculum content and development, and graduation requirements; however, there has been no consistency in how they can or should be discussing the growth of technology. When

faculty continue to struggle to hold on to the academic governances they are compassionate about, research indicates that they feel most excluded in the decision making processes that involved technology (Huff, 2000). Rice and Miller (2001) in their study on faculty involvement conclude decision-making participants' agree that administration should work collaboratively with faculty to identify priorities before making decisions regarding technology. Additional literature review supports that if faculty are to support technology initiatives, they must be actively involved in the decision-making processes. Students, which is often the largest group of users of institutional services, can be a pivotal voice in campus technology decisions and offer a different perspective from that of faculty and administrators (Schwartz, Craig, Trzeciak, Little, & Diaz, 2008).

Leadership and Learning with Technology

The dynamic changes in the successful use of technology for teaching and learning demands major change in the organizational culture associated with higher education. In his book *Managing Technological Change* Bates (2000) contented that higher education institutions must restructure how the institution plans, manages, and organizes in order to use technology to improve learning. Bates also offered practical, systematic strategies for creating the new technologically competitive academic organization. Technology must be embedded in the curriculum, taking the fundamentals and technology learned over a semester and applying it to a final project where creativity and uniqueness are required and rewarded (McNeely, 2005). Today's university is one of the most complex social institutions and consists of a complex system of shared governance that engages a variety of stakeholders in its decision making process (Neal & McClure, 2003). In their simplest form successful systemic approaches are

characterized by institutional facilitation, administrative direction, and faculty interest (Hartman, 2008). Colleges and universities are facing growing challenges as our economy transforms to a global network that is organized around the value of knowledge and the capacity for people and organizations to use technological innovations wisely, effectively, and efficiently (Hanna, 2000).

The successful use of technology for teaching and learning demands major changes in teaching and organizational culture (Bates, 2000). Because information technology skills are important in the world outside of higher education, educators need to examine their programs of study to make sure they are preparing students to survive and thrive in a technology-rich environment (Agee & Zenelis, 2002). The revolution in information technology is now driving the world economy and is beginning to drive higher education's response to it, and the institutions that have made commitments to IT development have done so in a systematic way in order to provide a successful methodology for delivering these needed and anticipated services (Huff, 2000).

Technology is changing the leadership methods in higher education. Academic leaders are striving harder to improve the quality and accessibility of teaching and learning in higher education while controlling costs and integrating new instructional applications (Foster & Hollowell, 1999). The widespread use of electronic teaching and learning aids are indispensable tools in achieving student success, but in addition to its impact in the classroom technology has also played a tremendous role in administrative areas. Enterprise Resource Planning (ERP) systems provide a centralized repository of administrative information needed to support senior management decisions (Greer, n.d.).

Confronting the Challenges

New organizations are emerging as major competitors of traditional colleges and universities. These emerging competitors see opportunities in four significant areas where traditional colleges and universities are struggling. According to Hanna (2000) the four areas where competitors see opportunities are: 1) increasing costs of university tuition; 2) a growing demand for learning; 3) a demand for content that can be applied in work settings; and 4) new technologies. The pressure for change is not only a direct result of competition from nontraditional organizations but also from legislators who expect colleges and universities to deliver what the public wants (Hanna). The emergence of new demands and new organizational forms of higher education places significant pressure on traditional colleges and universities to undergo fundamental changes in order to compete or in some cases to survive (Rowley & Sherman, 2001).

Today's tech-savvy students come to campus with new expectations of how technology will contribute to learning. Effective teaching and learning with or without technology is first about the learner. A year-long project at Brigham Young University (Mott & Granata, 2006) consisted of a process that revisited the existing methods of teaching and learning in an attempt to strategically map the institution's teaching and learning infrastructure. The results for improving teaching and learning at BYU consisted of five specific strategic goals:

1. Develop and support faculty instead of courses, enabling faculty members to integrate technology into their teaching and learning efforts effectively.
2. Develop and redefine distributed learning models to promote wider adoption of technology-mediated instruction.
3. Encourage and empower departments to take strategic advantage of available models, tools and resources.
4. Unify production and delivery of instructional materials across campus.

5. Effectively manage teaching and learning resources. (p. 51)

College and universities view technology as a key asset that helps create an intellectually energized campus that attracts the best students and faculty. Creating innovative services from current and future technologies requires a powerful, reliable, expandable, and secure IT infrastructure that has adequate bandwidth, quality of service, and storage (Wilen-Daugenti & McKee, 2008). Colleges and universities must be ready to embrace the change that is necessary to ensure success in meeting the current and future needs of the emerging college student.

Managing the Change

When an institution decides to implement new technology it is asking its employees and key stakeholders to adapt to new tools, processes, and policies that are likely to be very different from the ones they have grown accustomed to (Podolsky, 2003). Duderstadt (1999) comments that:

> Perhaps the most critical challenges facing most institutions will be to develop the capacity for change; to remove the constraints that prevent institutions from responding to the needs of rapidly changing societies; to remove unnecessary processes and administrative structures; to question existing premises and arrangements; and to challenge, excite, and embolden all members of the campus community to embark on what I believe will be a great adventure. (p. 1)

Each of these new ambitions that are central to the future of an institution has information technology as its core and creates new possibilities and new challenges for IT personnel and academic administrators (McCredie, 2000). Without question the landscape of education is changing rapidly—and much of the change witnessed is either brought on by technologies or is exacerbated by the presence and impact of technologies (Greer, 2006). To some the changes resulting from technology become an obstacle, while others cannot wait until the next phase of

technology hits the market. Academic administrators must address the need to find a balance and manage this type of radical change in expectation; however, there is a difference between change and transition (Podolsky, 2003). According to Podolsky a change occurs at a single point of time and something old stops and something new begins whereas a transition happens over time and occurs mainly through an internal process in individuals as they refocus their ways of feeling.

Another challenge facing technology planners is the risk associated with protecting the institution from the unwanted technologies. The growth of the networked information society presents new social, technical, and economic environments within which the institution functions (Benkler, 2008). Many of which are not productive or beneficial to academia. University networks and technical platforms now have to focus on managing the increasingly permeable boundaries among universities and between universities and the world outside them (Benkler). IT planners must guarantee that institutional networks are scalable, robust, ubiquitous, reliable, and secure because learners who use these technology services have come to expect nothing less (Floyd, 2008). Trend 2, globalization, and trend 11, Edutainment are two of the 12 trends referenced in a recent article by Wilen-Daugenti and McKee (2008) that pose significant challenges for securing the campus network.

Aligning the Technology Plan with the Strategic Plan

There is no optimal method to achieve alignment. Recognizing that in higher education "one size fits one," an effective planning process must take into account both the unique character of the institution as well as the breadth of planning processes and methodologies available (Pirani & Salaway, 2004). The acid test of strategy is whether it informs and constrains

decision-making by compelling leaders to align their functional goals and day-to-day decision making to the goals of the enterprise. There are many benefits to developing both a technology plan and a strategic plan, but the real effectiveness in planning happens when the two plans align with each other. Institutions must not get bogged down in lengthy, confusing technology planning that becomes hard to communicate to the people who will be using the technology. Podolsky (2003) defines a technology plan as:

> …a three-tiered pyramid. At the top of the pyramid are the mission, goals, and strategies. Supporting the mission are the technology applications, or tools, that enable an organization to achieve its mission. Finally supporting the applications is the infrastructure. All tiers are required to complete the pyramid and without a clear understanding of the mission, goals, and strategies, people will find it impossible to choose the right tools and applications or to establish the infrastructure necessary to achieve the mission. (p. 3)

The research by Higdon (2006) cited three critical areas of technology planning that must be reemphasized frequently during the planning process; internal communication, recurring funding, and transparent and collaborative decision-making. According to the 2004 ECAR study by Pirani and Salaway the challenge for higher education institutions is to align organizational plans, investments, priorities, and actions not only with institutional priorities emanating from the leadership but also with relevance to the rapidly shifting goals of disparate colleges, schools, and departments.

The Elements of an Effective Strategic Plan

Higher education's courtship with strategic planning was originally focused on facilities and space planning during an era of rapid expansion (Dooris et al., 2002). An effective strategic plan offers a comprehensive approach for creating, organizing, and implementing institutional strategies (Strategic Planning, n.d.). Sevier (2003) stated, "At its most basic, strategic planning

is all about creating an alignment between an organizations day-to-day activities and its environment—an alignment that facilitates the flow of resources to that organization" (p. 18). Strategic planning is increasingly about learning and creativity with the recognition that college and university leaders need to challenge assumptions and consider radically changing structures and processes (Dooris et al.). A recent higher education survey on leadership, innovation, and technology (Bassett, 2005) found little progress had been made in achieving strategic decision-making objectives even though strategic decision-making was one of the five highest-ranking institutional priorities among the 464 surveyed. The 2005 study did indicate that senior administrators were more likely to recognize the ways in which technology supported the institution's strategic objectives, a change from the 2004 survey (p.16).

Successful strategic planning depends on broad-based support and participation by organizational constituents. In the United States the IT profession has evolved from being about wires and networks to being about technology as a strategic asset (Oblinger, 2009). According to Cavalier (2002) when the critical success factors are incorporated into the strategic planning process, the institution realizes eight immediate benefits:

1. Proactive approach to future needs,
2. IT integration throughout the institution,
3. Team building,
4. Measurable goals and strategies,
5. Progress tracking,
6. Determining the impact of IT across the institution,
7. More accurate budget projection and rationale, and
8. A positively enhanced institutional culture (p. 10).

The Elements of an Effective Technology Plan

The need to align the technology plan with the strategic direction of the institution is critical in order to move the institution forward. A well-defined planning process enables the IT organization and other campus departments to develop a shared understanding of how technology can and should support their specific programs (McCredie, 2000). There is significant research on how to develop effective models for college and university leaders who want to ensure effective technology planning that reflects the goals of the institution. A universal step 1 is to create a documented detailed technology plan that gains consensus among IT personnel and academic administration (Bates, 2,000; McCredie; Penrod, 2003). An effective technology plan is about people, and the written technology plan represents the compilation of cooperative endeavors that emerge as people engage in meaningful, informed dialogue leading to significant, positive action for a technologically enhanced learning environment (Greer, 2006). In order to be successful a good technology plan begins with a vision statement, collaboration, and communication strategies that enlist faculty support (Holland & Steward, 2,000).

Once the plan is documented step 2 is to communicate the plan effectively to all stakeholders staying focused and weighing criticism throughout the communication process (Penrod, 2003). Communication involves more than providing a copy of the plan or a brief explanation of what is going to happen. Planning in higher education is no longer the responsibility of a small group of focused planners, it is the responsibility of every institutional leader (Boettcher, Doyle, & Jenson, 2,000). When organizations fail to involve key individuals in the planning process huge gaps emerge and become expensive obstacles to the learning environment (Olcott & Schmidt, 2000). The same effect can happen when the wrong people are involved in the planning process and the right people are left out. An effective technology

planning committee involves representatives from all areas within an institution and includes equal representation from IT leadership and members of the committee must perceive their participation to be of importance to the institution (Johnson et al., 2003; Penrod, 2003).

When planning for technology the concept of a technology driven life cycle theme can make a difference in how effective the technology plan can be. Developing a life cycle technology plan considers the usefulness of technology tools and is based on the usefulness of technology and its rate of change (Boettcher et al., 2000). Technology tools that consist of hardware, software, and infrastructure can become obsolete even though they appear to be functional. An inability to recognize and define a technology plan based on a life cycle technology that is reasonably affordable can frustrate end users and technology planners.

Effective planning for technology is based on short-term plans that have developed from long-term plans. Technology is changing at such a rapid pace that even a 3-year technology plan can be ineffective and should be assessed and modified annually. The technology committee members must be responsible and need to make the arguments that a particular technology is a worthwhile investment (Neal & McClure, 2003). Only after the committee agrees on the plan can the IT leaders begin their responsibility of implementing the technology in a cost-effective way. The desired outcome of effective technology planning is that the most appropriate technologies become infused into instructional or administrative programs where all parties will have equitable access and achieve benefits from the use of technology (Penrod, 2003).

The Technological Strategic Plan

Kaufman and Lick (2000) discussed a new strategic planning approach for higher education, mega-leveling strategic planning. Mega-level strategic planning is best achieved by

linking everything an educational agency uses, does, produces, and delivers to adding value to society and to internal and external partners (Kaufman & Lick). The concept of mega-strategic planning in my opinion incorporates the processes and methods necessary for achieving a technological strategic plan—a plan as defined in this research that has aligned the technology plan with the strategic plan. Figure 3 from the research of Kaufman and Lick provides a visual of how the alignment process works with the campus environment.

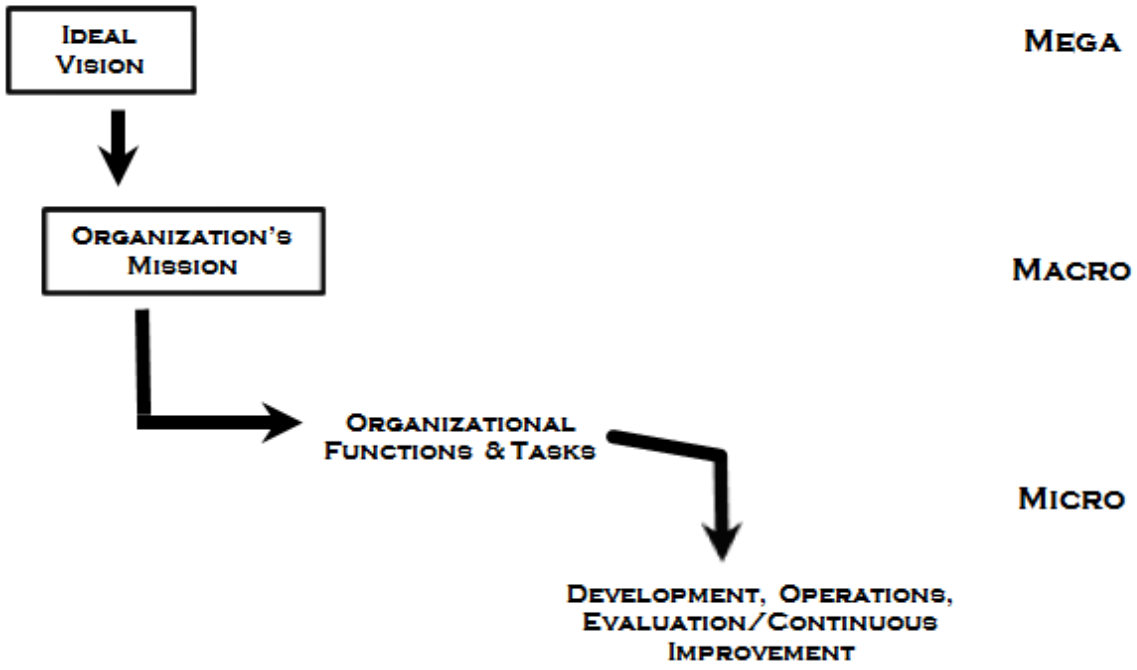

Figure 3. Strategic Alignment from Organizational Elements. Adapted from Kaufman and Lick, 2,000.

According to Kohrman (2008, p. 62) the comprehensive planning process could be broken down into three stages:

- Fix Your Sights on the Future (brainstorming);
- Chart the Course (how we are going to get there); and
- Check Your Bearings (monitor progress).

Figure 4 shows the stages, activities, and deliverables of the technological strategic planning process.

Stage	**Activities**	**Deliverables**
Fix Your Sights	Visioning and brainstorming, SWOT analysis	Draft vision statement; SWOT analysis; strategic objectives project evaluation criteria
Chart the Course	Brainstorming; prioritizing	Final strategic plan with vision and mission statements, strategic objectives; action items, and project evaluation criteria
Check Your Bearings	Compare actions and options against strategic plan; course corrections	Implemented projects that support the plan

Figure 4. ITS Strategic Planning Model. Adapted from Kohrman, 2008.

Strategic plans that are strategically aligned set the tone for a number of years (probably 3 to 5 years). Anyone who is responsible for budgeting and is tasked with ensuring that the long-term projects or program developments are properly funded must be included.

Balancing the Money

Budgeting involves a careful analysis of prior achievements, a realistic assessment of how the coming year will develop, and a reflection of the strategic and operational plans that will ensure institutional direction proceeds as planned (Schachter, 2005). Trinkle (2005) states "Institutions with unsuccessful investments seem to have adopted technologies blindly, paying little attention to the types of pedagogical practices that they reinforce or the employee skills and talents needed to make them succeed (p. 20). Most colleges and universities view the greatest challenge of information technology as its cost. According to the annual Market Data Retrieval survey reported by the *Chronicle of Higher Education Daily News* Olsen (2003) reported that:

> American colleges and universities expected to spend more than $5.2 billion on information technology, an amount that showed a 5% increase over what they budgeted for academic and administrative technology during the 2001-2002 academic year.

It seems clear that technology will shift higher education's expenditure mix and change faculty roles and responsibilities, but will it actually reduce cost (Duderstadt et al., 2002)? IT leaders continue to face growing expectations for new and existing IT services that exceed budget capacity. These expectations have caused a significant increase in the role of IT leadership in the institutions highest levels of planning and governance (Allison & DeBlois, 2008). In today's current economic environment it is vital that colleges and universities leverage their investments and enable cost-effective, labor-saving business processes (Scalia, 2002). This approach gets to the heart of campus functionality, its financial resources. The study "Issues of Strategic Implementation in Higher Education: The Special Concerns for Institutions in Developing Economies" by Rowley and Sherman (2001) indicates the most effective planning process for higher education is to tie funding to those items that support the progress of the strategic plan and not to fund, or perhaps significantly reduce funding to those areas, programs, or activities that do not support the strategic direction that the campus leadership has identified. Controlling the budget is one of the most important methods of effectively instituting a strategic plan. The typical IT department juggles an assorted collection of investments in infrastructure, applications, and information. Most IT organizations simultaneously manage numerous projects that might collectively represent millions of dollars of investment capital and provides basic infrastructure and supports the pursuit of the institution's strategic goals (Jeffery & Goldstein, 2005).

Institutional Financial Strategy

IT leaders will continue to be challenged by funding pressures and new service demands. The ability for colleges and universities to guarantee financial stability means they must continue to show progress with shared institutional vision, campus-wide communication, and multiyear planning (Allison & DeBlois, 2008). Changing patterns of university financing and management strategies and practices have obliged academic department heads in higher education institutions to assume greater responsibility for both human resource management and traditional academic matters (Leach, 2008). In order to achieve high quality, cost-effective results, financial strategy should be based on a project management approach where funding is tied to clear project objectives and defined budgets (Bates, 2,000).

Technology integration is a strategic resource, and academic administrators at all levels should consider its priorities at the same time and in similar ways as it evaluates other strategic campus needs (Smallen & McCredie, 2003). Because IT and business processes are inextricably linked it is increasingly difficult to make effective decisions about either area in isolation (McCord, 2003). Budgeting looks at the operating resources of a college campus and makes decisions regarding how best to apply them to achieve desired ends and if the decision rules are dependent upon the strategic plan, then this method works on any campus (Rowley & Sherman, 2001).

Affording Technology Initiatives

It is essential that institutions understand the costs of using new technology. Foster and Hollowell (1999) in their article "Integrating Information Technology Planning and Funding at the Institutional Level" ask, "Is it possible to spend too much on technology?" (p. 17). The

answer of course is yes! Whether institutions are public or private, large or small, there is a defined decrease in available funding. Some institutions are responding by focusing on technology, while others are questioning its effectiveness.

It seems clear that technology will shift higher education's expenditure mix of capital funds. In an effort to balance funding for technology effectively colleges and universities need to find creative methods to create or redirect revenue sources (Foster & Hollowell, 1999). In a February 2005 study "IT Portfolio Management for Colleges and Universities" Mark Jeffery from the Kellogg School of Management at Northwestern University and Phillip J. Goldstein from EDUCAUSE's Center of Applied Research surveyed executives from world-class enterprises to define the best practices for IT Portfolio Management (ITPM). Their study focused on the use of ITPM as an effective tool for IT managers in higher education as a means for strategically funding IT projects on their campuses (Jeffery & Goldstein).

CHAPTER 3

RESEARCH METHODOLOGY

Introduction

This chapter describes the methodology used in this study for determining the relationship between technology planning and strategic planning in small private liberal arts colleges and universities. A major objective was to attempt to determine the role of technology driven strategic planning in the member institutions of the Appalachian College Association (ACA). Chapter 3 includes a description of the research design, an explanation of the population and sample, the design of the survey instrument including the variables and hypotheses to be derived from the instrument, and a description of data collection and analysis.

Research Design

The purpose of this study is to determine the relationship between technology planning and strategic planning in small private liberal arts colleges and universities, specifically those who are members of the Appalachian College Association (ACA). Overall, the study determined if the technology initiatives of the ACA institutions are appropriately aligned to their institutional strategic plans and if so is the strategic plan used effectively as a tool for adequately communicating technology needs to the departments within the institution. Primary data were collected from first-level institutional administrators including key academic and administrative leaders who completed the online survey. The online survey instrument was developed and peer-reviewed before administered to participants. In addition, IRB approval was sought and obtained before the instrument was administered to participants online.

Population and Sample

The population for this study included:

1. Administrators who served in the capacities of first level academic officers (vice president of academics, provost, chief academic officer, etc.) who are members of the Appalachian College Association (ACA).
2. Administrators who served in the capacities of first level administrative officers (vice president of finance, vice president enrolment management, chief operations officer, etc.) who are members of the Appalachian College Association (ACA).
3. Administrators who served in the capacities of first-level Information Technology (IT) officers (vice president, chief information officer, etc.) who are members of the Appalachian College Association (ACA).
4. Administrators who reported to a first level academic, administrative, or information technology officer and served in the capacities of second-level administrators (department chairs, coordinators, deans, or directors) who are members of the Appalachian College Association (ACA).

Key administrators were selected based on their roles as institutional planners for either strategic or technology initiatives.

Variables

Two questions from the online survey were used to obtain demographic data. Some demographic data were obtained by research from institutional websites. Additional variables that I gathered from the survey included, job classification, participants' perception of their role

in technology and strategic planning, participants' perception of the role of IT in strategic planning, and participants' perception on how affective strategic and technology planning were used to communicate technology needs for the institution. The predictor variables of position within the institution and institution size as reported in FTE (Full-time Equivalent) enrollment were measured using a 25-question online survey. Responses to the question regarding position within the institution resulted in four categories, academic officer (VP) or first level academic manager, administrative officer (VP) or first level administrative manager, chief information officer or first level IT manager, and chair/coordinator/dean/director or second level manager (reports to a first level administrators). Responses to the question regarding size of institution resulted in four categories ranging from <1,000 FTE to >2,000 FTE. The criterion variables in the study included the information gained from the five research questions included in Chapter 1 and restated in Chapter 3.

Survey Instrument Design

The online survey instrument was developed and peers tested and reviewed it for accuracy and clarity. Several adjustments were made and I used the assistance of several institution administrators from within the proposed invited participants who were familiar with either strategic planning, technology planning, or both to format the online survey. These individuals helped me with clarity in phrasing the questions. Their guidance helped me develop the appropriateness of each question and response. I also selected a group of individuals who were not a part of the invited participants but who were familiar with the processes of dissertational research to help me with a peer-review and critique of the online survey before it

was administered. Both processes followed a basic peer review that focused on clarity and appropriateness for each question.

Research Questions with Null Hypotheses

The five research questions from Chapter 1 were used to test the following hypotheses. Each of the five questions included two hypotheses that were used to determine the extent to which the technology initiatives that are used by the member institutions of the ACA consortium were appropriately aligned to their strategic plan, and to determine if the strategic plan was useful for adequately communicating technology needs to the departments within these ACA institutions. Each hypothesis is stated below in the null form.

Research Question 1

To what extent is technology an integral component of the strategic planning process in ACA institutions was tested using the following null hypotheses:

H1a: There is no difference among the positions of administrators regarding the perception that technology is an integral component of the strategic planning process in institutions that are members of the ACA consortium;

H1b: There is no relationship based on the size of the institution measured in FTE enrollment regarding the perception that technology is an integral component of the strategic planning process in institutions that are members of the ACA consortium.

Research Question 2

To what extent are faculty administrators involved in planning for technology in institutions that are members of the ACA consortium was tested using the following null hypotheses:

H2a: There is no difference between and among the positions of administrators that faculty administrators are involved in planning for technology in institutions that are members of the ACA consortium;

H2b: There is no relationship based on the size of the institution measured in FTE enrollment that faculty administrators are involved in planning for technology in institutions that are members of the ACA consortium.

Research Question 3

To what extent are staff administrators involved in planning for technology in institutions that are members of the ACA consortium was tested using the following null hypotheses:

H3a: There is no difference between and among the positions of administrators, that staff administrators are involved in planning for technology in institutions that are members of the ACA consortium;

H3b: There is no relationship based on the size of the institution measured in FTE enrollment that staff administrators are involved in planning for technology in institutions that are members of the ACA consortium.

Research Question 4

To what extent are information technology leaders involved in strategic planning in institutions that are members of the ACA consortium was tested using the following null hypotheses:

H4a: There is no difference between and among the positions of administrators, that information technology leaders are involved in the strategic planning process in institutions that are members of the ACA consortium;

H4b: There is no relationship based on the size of the institution measured in FTE enrollment that information technology leaders are involved in the strategic planning process in institutions that are members of the ACA consortium.

Research Question 5

To what extent do institutional budget considerations align with strategic planning for technology in institutions that are members of the ACA consortium was tested using the following null hypotheses:

H5a: There is no difference between and among the positions of administrators, that institutional budgets are appropriately aligned with the process of strategically planning for technology during the strategic planning process in institutions that are members of the ACA consortium;

H5b: There is no relationship based on the size of the institution measured in FTE enrollment that institutional budgets are appropriately aligned with the process of strategically planning for technology during the strategic planning process in institutions that are members of the ACA consortium.

Data Collection

Participant names were obtained by conducting a web search for each of the 35 institutions or by contacting key individuals at each institution to obtain clarification of expected

invited participants. Institutional organizational charts were used to determine first-level administrators as academic, administrative, or information technology (IT). If an institution's web site named an individual as head of an academic unit or director of an administrative unit, that person was invited to participate in the survey. It was often difficult to determine the organizational hierarchy, and even before the survey was developed it was apparent that the organizational structure for each institution varied significantly. I submitted online surveys to faculty and staff at 34 of the member institutions who met the above criteria. Surveys were not sent to one of the member institutions because access to Email addresses or academic organizational charts were not available to determine the appropriate participants. Several attempts were made to obtain this information. Two hundred fifty-five participants were invited to participate and were sent Emails that included the online survey. The online survey was uniquely submitted using the Zoomerang toolset and individual Emails were sent to each person. Two reminder Emails were sent following the initial Email, one 2 weeks from the first and the other 2 weeks from the second. Of the 255 invited participants, 171 people viewed the survey, 146 of those people started the survey and 142 (55.7%) completed the survey. Four people partially completed the survey but sent Emails explaining why they elected not to complete the survey. I received 19 Emails from people who did not attempt to take the survey with comments as to why they did not participate in the survey.

I used a professional subscription to Zoomerang to convert the final questionnaire into an online survey. Zoomerang's tools were also used to administer the survey to the invited participants. Zoomerang is a powerful self-service alternative for conducting accurate comprehensive online surveys. The participant information was stored in Zoomerang's online database which is hosted on secure servers. The data will be archived from the Zoomerang

servers to electronic media 6 months after I have defended my dissertation research. The electronic media will be stored at my home and accessible for 3 years, after that I will destroy them.

I exported database results from Zoomerang using Microsoft Excel and used Excel to generate and report the descriptive statistics. I exported the Excel data into the Statistical Package for Research Software Program (SPSS) to generate and report inferential statistics. I used Email as my method to send individual survey requests to the invited participants. The Email included a hyperlink that transported the invited participant directly to the online survey. I included a brief summary of the purpose of the study and general instructions on how to participate in the survey in each Email that was sent. I sent three Emails, an initial invitation, a reminder 2 weeks later, and a final reminder 1week following the second Email. A copy of each Email is available as Appendix A, Appendix B, and Appendix C respectfully. A copy of the online survey is available as Appendix D.

Data Analysis

I used both descriptive and inferential statistics to analyze and present the data. Descriptive statistics are presented in table format for each of the 25 questions. Inferential statistics were also presented in table format, followed by a brief interpretation of the test results. I used SPSS to run the descriptive crosstab tests necessary to describe the relationships between the independent and dependent variables. The results are presented in tables 4 through 49. In order to address the 10 hypotheses for research questions 1 through 5, I used SPSS to run the one-way analysis of variance (ANOVA) tests to determine differences and relationships within

the data. The results are presented in tables 50 through 81 of Chapter 4. I ran the SPSS test for Pearson's Chi-Square on question 25 because the responses contained dichotomous values.

Summary

Chapter 3 has described the methodology that was used to provide answers to the question of whether the technology initiatives were appropriately aligned to institutional strategic plans and whether these planning documents were used effectively to communicate technology needs in the ACA institutions. I have included the 10 hypotheses that were used to test the five research questions posed in this study. Additionally this chapter has provided a description of the population and sample, the variables of the study, the design of the online survey, the methods of data collection, and the procedures that were used for conducting the data analysis.

CHAPTER 4

RESULTS OF THE STUDY

Summary of Data

This chapter provides a demographic profile and presents an analysis of data collected from the faculty and staff of the 35 member institutions from the Appalachian College Association (ACA). The demographic data are presented based on the respondents' administrative position within the institution. In addition there is a demographic summary presented by size of the institution measured in Full Time Equivalent (FTE) enrollment. A variety of statistical methods were used to classify, explain, and analyze the data to produce the research results in tabular format. Descriptive statistics were used to present a summary of the characteristics of the data. Response rates represented in table format are given for each question by position within the institution and size of the institution measured by FTE enrollment. Means and standard deviations were calculated and served as the basis for further data analysis. These analyses were performed using inferential statistical methods appropriate for the level of measurements of the data. Inferential tests included the one-way analysis of variance (ANOVA), and where variables were dichotomous (only question 25) Pearson's Chi-Square. Microsoft Excel as well as SPSS was used to conduct and present the analyses. Tables displaying the results of the descriptive and inferential statistics follow in succeeding sections of this chapter.

Table 1 shows the count and percent for the invited participates by position within the institution. First-level administrators were divided into three groups, Academic Administrators (37), Administrative Administrators (57), and IT Administrators (34) and collectively totaled 128. Second-level managers consisted of department chairs, coordinators, deans, or directors. This group comprised the largest number of invited participants at 127.

Table 1

Demographic Summary Position Within Institution

Position	N	%
Academic Administrator	37	14.5%
Administrative Administrator	57	22.4%
IT Administrator	34	13.3%
Chair/Coordinator/Dean/Director	127	49.8%
TOTAL	255	100%

Table 2 shows the count and percent for the invited participates based on the size of the institution measured in FTE enrollment. The largest number of invited participants were employed by intuitions whose FTE enrollment was less than 1,500 students, 36% had FTEs less than 1,000, and 38% had FTEs between 1,000 and 1,500. Only 8.6% of the invited participants were employed at institutions with FTE between 1,501 and 2,000 and 17% of the invited participants were employed at institutions with greater than 2,000 FTE enrollment.

Table 2

Demographic Summary Size of Institution as Measured in FTE

Institution	N	%
< 1,000	91	35.7%
1,000 – 1,500	98	38.4%
1,501 – 2,000	22	8.6%
>2,000	44	17.3%
TOTAL invited participants	255	100%

Table 3 shows the relationship between first-level administrators and second-level administrators. My goal was to gather data from an equal number of first-level administrators and second-level administrators. It was difficult to know if the balance was achieved until data were received and analyzed. The goal was achieved with 56% of the respondents classified as first-level administrators and 44% as second-level administrators.

Table 3

Demographic Summary First Versus Second-level Administrator

Position First vs. Second-level	N	%
First-level Administrator (Academic, Administrative, and IT)	128	50%
Second-level Administrator (chair/coordinator/dean/director)	127	50%
TOTAL	255	100%

This study was undertaken to determine whether the technology initiatives were appropriately aligned to institutional strategic plans and whether these planning documents were used effectively to communicate technology needs in the ACA institutions. Two fundamental questions were posed: 1) Is there a difference among positions regarding whether the technology initiatives were appropriately aligned to institutional strategic plans and whether these planning documents were used effectively to communicate technology needs? and 2) Is there a difference between the size of institution regarding whether the technology initiatives were appropriately aligned to institutional strategic plans and whether these planning documents were used effectively to communicate technology needs? The first step in answering these questions was to formulate tables to show the response rate by position and by institution size to be used as a

reference for further analyses. Because the online survey that was used enforced an answer be supplied for every question, n for each question that allowed only one response stayed at a constant 142. For those questions that allowed multiple responses, only question 25, n is stated with the corresponding table. Tables 4 through 49 describe the resulting descriptive data.

Table 4

Were There Documented Strategic Planning Guidelines?

Position	No	Yes
Academic Administrator	10%	90%
Administrative Administrator	15%	85%
IT Administrator	35%	65%
Chair/Coordinator/Dean/Director	8%	92%
Count = 142	13%	87%

Table 5

Were Strategic Mission, Vision, and Goals Easily Identified and Recognized?

Position	No	Yes
Academic Administrator	13%	87%
Administrative Administrator	0%	100%
IT Administrator	18%	82%
Chair/Coordinator/Dean/Director	16%	84%
Count = 142	12%	88%

Table 6

Were Second-level Administrators Represented on Strategic Planning Committee?

Position	No	Yes
Academic Administrator	17%	83%
Administrative Administrator	15%	85%
IT Administrator	29%	71%
Chair/Coordinator/Dean/Director	16%	84%
Count = 142	18%	82%

Table 7

Was the IT Administrator Represented on Strategic Planning Committee?

Position	No	Yes
Academic Administrator	30%	70%
Administrative Administrator	21%	79%
IT Administrator	53%	47%
Chair/Coordinator/Dean/Director	31%	69%
Count = 142	31%	69%

Table 8

Was Technology Plan Available and Used for Reference by Strategic Planning Committee?

Position	No	Yes
Academic Administrator	33%	67%
Administrative Administrator	36%	64%
IT Administrator	59%	41%
Chair/Coordinator/Dean/Director	39%	61%
Count = 142	39%	61%

Table 9

Were There Documented Technology Planning Guidelines?

Position	No	Yes
Academic Administrator	43%	57%
Administrative Administrator	39%	61%
IT Administrator	59%	41%
Chair/Coordinator/Dean/Director	47%	53%
Count = 142	46%	54%

Table 10

Were Technology Initiatives Easily Identified and Recognized?

Position	No	Yes
Academic Administrator	40%	60%
Administrative Administrator	49%	52%
IT Administrator	47%	53%
Chair/Coordinator/Dean/Director	53%	47%
Count = 142	49%	51%

Table 11

Were Second-level Administrators Represented on Technology Planning Committee?

Position	No	Yes
Academic Administrator	37%	63%
Administrative Administrator	52%	49%
IT Administrator	36%	65%
Chair/Coordinator/Dean/Director	47%	53%
Count = 142	44%	56%

Table 12

Were First-level Administrators Represented on Technology Planning Committee?

Position	No	Yes
Academic Administrator	23%	77%
Administrative Administrator	36%	64%
IT Administrator	47%	53%
Chair/Coordinator/Dean/Director	36%	65%
Count = 142	35%	66%

Table 13

Was Strategic Plan Used for Reference by Members of Technology Planning Committee?

Position	No	Yes
Academic Administrator	20%	80%
Administrative Administrator	9%	91%
IT Administrator	41%	59%
Chair/Coordinator/Dean/Director	18%	82%
Count = 142	19%	81%

Table 14

Was Strategic Plan, Technology Plan, or Both Used for Reference During Budget Planning?

Position	Strategic Plan	Technology Plan	Both	Neither
Academic Administrator	50%	0%	50%	0%
Administrative Administrator	39%	3%	52%	6%
IT Administrator	29%	18%	24%	29%
Chair/Coordinator/Dean/Director	34%	2%	47%	17%
Count = 142	38%	4%	46%	12%

Table 15

Extent Strategic Planning Guidelines Were Helpful in Achieving Institutional Vision

Position	Great	Moderate	Slight	Not at All	No Opinion
Academic Administrator	40%	40%	13%	0%	7%
Administrative Administrator	39%	46%	9%	0%	6%
IT Administrator	12%	59%	24%	0%	5%
Chair/Coordinator/Dean/Director	29%	29%	24%	8%	10%
Count = 142	32%	39%	18%	4%	7%

Table 16

Extent Technology Planning Guidelines Were Helpful in Achieving Technology Initiatives

Position	Great	Moderate	Slight	Not at All	No Opinion
Academic Administrator	27%	27%	16%	3%	27%
Administrative Administrator	15%	42%	24%	4%	15%
IT Administrator	12%	35%	35%	6%	12%
Chair/Coordinator/Dean/Director	19%	27%	21%	9%	24%
Count = 142	19%	32%	23%	5%	21%

Table 17

Extent Technology Plan Was Aligned with Institutional Strategic Plan

Position	Great	Moderate	Slight	Not at All	No Opinion
Academic Administrator	30%	33%	7%	7%	23%
Administrative Administrator	27%	30%	30%	0%	13%
IT Administrator	24%	41%	6%	18%	11%
Chair/Coordinator/Dean/Director	27%	32%	15%	8%	18%
Count = 142	27%	33%	16%	7%	17%

Table 18

Extent Strategic Plan and Technology Plan Were Funded by Budget

Position	Great	Moderate	Slight	Not at All	No Opinion
Academic Administrator	23%	40%	27%	0%	10%
Administrative Administrator	9%	55%	24%	3%	9%
IT Administrator	6%	41%	29%	18%	6%
Chair/Coordinator/Dean/Director	23%	24%	37%	7%	10%
Count = 142	18%	36%	31%	6%	9%

Table 19

Extent Second-level Administrators Were Involved in Budget Planning

Position	Great	Moderate	Slight	Not at All	No Opinion
Academic Administrator	30%	44%	23%	0%	3%
Administrative Administrator	39%	49%	9%	3%	0%
IT Administrator	24%	35%	29%	6%	6%
Chair/Coordinator/Dean/Director	31%	42%	23%	4%	0%
Count = 142	32%	43%	20%	4%	1%

Table 20

How Often Were IT Administrators Relied on for Guidance?

Position	Very Frequently	Frequently	Occasionally	Rarely	Not at All	No Opinion
Academic Administrator	27%	34%	30%	0%	3%	6%
Administrative Administrator	33%	18%	39%	0%	0%	10%
IT Administrator	18%	29%	35%	12%	6%	0%
Chair/Coordinator/ Dean/Director	18%	27%	32%	8%	2%	13%
Count = 142	23%	27%	34%	5%	2%	9%

Table 21

How Often Were First-level Administrators Relied on for Guidance?

Position	Very Frequently	Frequently	Occasionally	Rarely	Not at All	No Opinion
Academic Administrator	23%	47%	20%	0%	0%	10%
Administrative Administrator	25%	39%	33%	0%	0%	3%
IT Administrator	6%	29%	53%	6%	0%	6%
Chair/Coordinator/ Dean/Director	19%	21%	39%	11%	0%	10%
Count = 142	20%	32%	35%	6%	0%	7%

Table 22

How Often Were Second-level Administrators Relied on for Guidance?

Position	Very Frequently	Frequently	Occasionally	Rarely	Not at All	No Opinion
Academic Administrator	7%	37%	40%	7%	0%	10%
Administrative Administrator	12%	27%	49%	6%	0%	6%
IT Administrator	6%	47%	29%	18%	0%	0%
Chair/Coordinator/ Dean/Director	9%	21%	48%	16%	3%	3%
Count = 142	9%	29%	44%	12%	1%	5%

Table 23

How Often Were Strategic Planning Documents Used to Communicate Technology Needs?

Position	Very Frequently	Frequently	Occasionally	Rarely	Not at All	No Opinion
Academic Administrator	3%	37%	30%	17%	0%	13%
Administrative Administrator	22%	15%	42%	15%	0%	6%
IT Administrator	12%	12%	35%	24%	5%	12%
Chair/Coordinator/ Dean/Director	3%	26%	31%	19%	10%	11%
Count = 142	9%	24%	34%	18%	4%	11%

Table 24

How Often Were Technology Planning Documents Used to Communicate Technology Needs?

Position	Very Frequently	Frequently	Occasionally	Rarely	Not at All	No Opinion
Academic Administrator	10%	17%	30%	7%	6%	30%
Administrative Administrator	12%	27%	24%	21%	4%	12%
IT Administrator	12%	5%	47%	12%	12%	12%
Chair/Coordinator/ Dean/Director	6%	21%	36%	11%	8%	18%
Count = 142	9%	20%	33%	13%	7%	18%

Table 25

How Often Was Technology Used as a Strategy to Achieve Institutional Goals?

Position	Very Frequently	Frequently	Occasionally	Rarely	Not at All	No Opinion
Academic Administrator	10%	43%	30%	7%	0%	10%
Administrative Administrator	3%	42%	46%	3%	0%	6%
IT Administrator	18%	18%	35%	24%	5%	0%
Chair/Coordinator/ Dean/Director	8%	32%	44%	10%	2%	4%
Count = 142	9%	35%	40%	9%	1%	6%

Table 26

Scenarios That Best Suited Technology Planning and Budget

Position	1	2	3	4	5	6
Academic Administrator	46%	10%	33%	0%	8%	3%
Administrative Administrator	39%	9%	43%	2%	0%	7%
IT Administrator	28%	4%	48%	8%	12%	0%
Chair/Coordinator/ Dean/Director	38%	8%	34%	1%	7%	11%

Count = 190

1. Budgeted for and Purchased New Technology for Classroom Instruction
2. Did Not Budget But Had to Purchase Technology to Upgrade Our Network Infrastructure to Support New Technology
3. Budgeted for and Purchased Technology to Upgrade Student Computer Labs and Faculty and staff Computers
4. Decided to Purchase Technology for Classroom Instruction During the Summer Months Because We Had Extra Money and Available Time
5. We Were too Busy Taking Care of Older, Outdated Technology Equipment to Plan for New Technology
6. No Opinion

Table 27

Were There Documented Strategic Planning Guidelines?

Institution	No	Yes
<1,000 FTE	12%	88%
1,000-1,500 FTE	10%	90%
1,501-2,000 FTE	10%	90%
>2,000 FTE	23%	77%
Count = 142	13%	87%

Table 28

Were Strategic Mission, Vision, and Goals Easily Identified and Recognized?

Institution	No	Yes
<1,000 FTE	14%	86%
1,000-1,500 FTE	8%	92%
1,501-2,000 FTE	10%	90%
>2,000 FTE	16%	84%
Count = 142	12%	88%

Table 29

Were Second-level Administrators Represented on Strategic Planning Committee?

Institution	No	Yes
<1,000 FTE	16%	84%
1,000-1,500 FTE	23%	77%
1,501-2,000 FTE	10%	90%
>2,000 FTE	13%	87%
Count = 142	18%	82%

Table 30

Was the IT Administrator Represented on the Strategic Planning Committee?

Institution	No	Yes
<1,000 FTE	35%	65%
1,000-1,500 FTE	29%	71%
1,501-2,000 FTE	60%	40%
>2,000 FTE	19%	81%
Count = 142	31%	69%

Table 31

Was Technology Plan Available and Used for Reference by Strategic Planning Committee?

Institution	No	Yes
<1,000 FTE	47%	53%
1,000-1,500 FTE	35%	65%
1,501-2,000 FTE	40%	60%
>2,000 FTE	36%	65%
Count = 142	39%	61%

Table 32

Were There Documented Technology Planning Guidelines?

Institution	No	Yes
<1,000 FTE	47%	53%
1,000-1,500 FTE	42%	58%
1,501-2,000 FTE	40%	60%
>2,000 FTE	52%	48%
Count = 142	46%	54%

Table 33

Were Technology Initiatives Easily Identified and Recognized?

Institution	No	Yes
<1,000 FTE	53%	47%
1,000-1,500 FTE	37%	64%
1,501-2,000 FTE	40%	60%
>2,000 FTE	65%	36%
Count = 142	49%	51%

Table 34

Were Second-level Administrators Represented on Technology Planning Committee?

Institution	No	Yes
<1,000 FTE	51%	49%
1,000-1,500 FTE	44%	56%
1,501-2,000 FTE	60%	40%
>2,000 FTE	29%	71%
Count = 142	44%	56%

Table 35

Were First-level Administrators Represented on Technology Planning Committee?

Institution	No	Yes
<1,000 FTE	43%	57%
1,000-1,500 FTE	31%	69%
1,501-2,000 FTE	20%	80%
>2,000 FTE	32%	68%
Count = 142	35%	66%

Table 36

Was Strategic Plan Used for Reference by Members of Technology Planning Committee?

Institution	No	Yes
<1,000 FTE	16%	84%
1,000-1,500 FTE	15%	85%
1,501-2,000 FTE	10%	90%
>2,000 FTE	32%	68%
Count = 142	19%	81%

Table 37

Was Strategic Plan, Technology Plan, or Both Used for Reference During Budget Planning?

Institution	Strategic Plan	Technology Plan	Both	Neither
<1,000 FTE	22%	7%	63%	8%
1,000-1,500 FTE	46%	2%	38%	14%
1,501-2,000 FTE	50%	0%	40%	10%
>2,000 FTE	45%	4%	32%	19%
Count = 142	38%	3%	46%	13%

Table 38

Extent Strategic Planning Guidelines Were Helpful in Achieving Institutional Vision

Institution	Great	Moderate	Slight	Not at All	No Opinion
<1,000 FTE	35%	47%	10%	2%	6%
1,000-1,500 FTE	31%	37%	23%	3%	6%
1,501-2,000 FTE	70%	20%	10%	0%	0%
>2,000 FTE	16%	35%	26%	7%	16%
Count = 142	32%	39%	18%	4%	8%

Table 39

Extent Technology Planning Guidelines Were Helpful in Achieving Technology Initiatives

Institution	Great	Moderate	Slight	Not at All	No Opinion
<1,000 FTE	24%	29%	14%	0%	33%
1,000-1,500 FTE	14%	40%	27%	6%	13%
1,501-2,000 FTE	30%	40%	20%	10%	0%
>2,000 FTE	16%	19%	29%	13%	23%
Count = 142	19%	32%	22%	6%	21%

Table 40

Extent Technology Plan Was Aligned with Institutional Strategic Plan

Institution	Great	Moderate	Slight	Not at All	No Opinion
<1,000 FTE	29%	29%	12%	6%	24%
1,000-1,500 FTE	27%	32%	25%	2%	14%
1,501-2,000 FTE	40%	60%	0%	0%	0%
>2,000 FTE	23%	36%	10%	19%	12%
Count = 142	27%	33%	16%	7%	17%

Table 41

Extent Strategic Plan and Technology Plan Were Funded by Budget

Institution	Great	Moderate	Slight	Not at All	No Opinion
<1,000 FTE	14%	43%	27%	2%	14%
1,000-1,500 FTE	14%	36%	36%	8%	6%
1,501-2,000 FTE	90%	10%	0%	0%	0%
>2,000 FTE	6%	35%	39%	10%	10%
Count = 142	17%	37%	31%	6%	9%

Table 42

Extent Second-level Administrators Were Involved in Budget Planning

Institution	Great	Moderate	Slight	Not at All	No Opinion
<1,000 FTE	27%	49%	16%	4%	4%
1,000-1,500 FTE	25%	44%	29%	2%	0%
1,501-2,000 FTE	70%	30%	0%	0%	0%
>2,000 FTE	39%	36%	19%	6%	0%
Count = 142	32%	43%	20%	4%	1%

Table 43

How Often Were IT Administrators Relied on for Guidance?

Institution	Very Frequently	Frequently	Occasionally	Rarely	Not at All	No Opinion
<1,000 FTE	26%	25%	27%	2%	4%	16%
1,000-1,500 FTE	25%	29%	39%	2%	0%	5%
1,501-2,000 FTE	30%	30%	30%	0%	0%	10%
>2,000 FTE	13%	26%	39%	16%	3%	3%
Count = 142	23%	27%	34%	5%	2%	9%

Table 44

How Often Were First-level Administrators Relied on for Guidance?

Institution	Very Frequently	Frequently	Occasionally	Rarely	Not at All	No Opinion
<1,000 FTE	24%	29%	35%	0%	0%	12%
1,000-1,500 FTE	18%	33%	35%	8%	0%	6%
1,501-2,000 FTE	40%	10%	40%	0%	0%	10%
>2,000 FTE	6%	42%	36%	13%	0%	3%
Count = 142	19%	32%	35%	6%	0%	8%

Table 45

How Often Were Second-level Administrators Relied on for Guidance?

Institution	Very Frequently	Frequently	Occasionally	Rarely	Not at All	No Opinion
<1,000 FTE	12%	27%	45%	8%	0%	8%
1,000-1,500 FTE	8%	34%	44%	8%	2%	4%
1,501-2,000 FTE	10%	20%	50%	20%	0%	0%
>2,000 FTE	3%	26%	42%	23%	3%	3%
Count = 142	9%	29%	45%	11%	1%	5%

Table 46

How Often Were Strategic Planning Documents Used to Communicate Technology Needs?

Institution	Very Frequently	Frequently	Occasionally	Rarely	Not at All	No Opinion
<1,000 FTE	14%	25%	25%	20%	4%	12%
1,000-1,500 FTE	4%	23%	46%	17%	2%	8%
1,501-2,000 FTE	10%	40%	30%	10%	10%	0%
>2,000 FTE	7%	19%	29%	19%	10%	16%
Count = 142	8%	24%	34%	18%	5%	11%

Table 47

How Often Were Technology Planning Documents Used to Communicate Technology Needs?

Institution	Very Frequently	Frequently	Occasionally	Rarely	Not at All	No Opinion
<1,000 FTE	14%	22%	16%	16%	3%	29%
1,000-1,500 FTE	10%	17%	48%	6%	8%	11%
1,501-2,000 FTE	10%	40%	30%	10%	10%	0%
>2,000 FTE	0%	13%	36%	19%	13%	19%
Count = 142	9%	20%	33%	13%	7%	18%

Table 48

How Often Was Technology Used as a Strategy to Achieve Institutional Goals?

Institution	Very Frequently	Frequently	Occasionally	Rarely	Not at All	No Opinion
<1,000 FTE	6%	41%	29%	12%	2%	10%
1,000-1,500 FTE	12%	27%	56%	2%	0%	3%
1,501-2,000 FTE	20%	60%	20%	0%	0%	0%
>2,000 FTE	4%	32%	39%	19%	3%	3%
Count = 142	9%	35%	40%	9%	1%	6%

Table 49

Scenarios That Best Suited Technology Planning and the Budget?

Institution	1	2	3	4	5	6
<1,000 FTE	34%	6%	43%	3%	8%	6%
1,000-1,500 FTE	37%	6%	42%	2%	6%	8%
1,501-2,000 FTE	60%	7%	33%	0%	0%	0%
>2,000 FTE	40%	16%	26%	2%	7%	9%

Count = 190

1. Budgeted for and Purchased New Technology for Classroom Instruction
2. Did Not Budget But Had to Purchase Technology to Upgrade Our Network Infrastructure to Support New Technology
3. Budgeted for and Purchased Technology to Upgrade Student Computer Labs and Faculty and staff Computers
4. Decided to Purchase Technology for Classroom Instruction During the Summer Months Because We Had Extra Money and Available Time
5. We Were too Busy Taking Care of Older, Outdated Technology Equipment to Plan for New Technology
6. No Opinion

Analysis of Data

An online survey consisting of 25 questions was used to test five hypotheses that were developed for this study. The survey data were compiled using statistical methods to theorize

based on the two predictor variables of position within the institution and size of the institution measured in FTE enrollment. Questions 1 and 2 of the survey were used to establish the predictor variables. I ran statistical tests for each predictor variable against questions 3 through 25 of the online survey. I began by running frequency tests, which were used to determine which descriptive and inferential tests were needed to further analyze the data. I ran the descriptive tests of crosstabs for reporting the ratio in percent. I ran the inferential tests of ANOVA for questions 13 through 24 to determine variance between the responses based on position within the institution and size of the institution measured in FTE enrollment. I ran crosstab descriptive tests with the inferential option Pearson's Chi Square on question 25. The results for the inferential data are presented in tables 50 through 81.

The study addressed the following research questions:

Research Question 1

I used eight of the online survey questions to test the hypotheses for Research Question 1, to what extent is technology an integral component of the strategic planning process in ACA institutions.

A one-way ANOVA was conducted to evaluate whether the strategic plan, the technology plan, or both were used as reference during budget planning among the positions within the institutions. The ANOVA was not significant at the $p < .05$ level, $F(3,138) = 1.54$, $p = .208$. The strength of the relationship between positions within the institutions and whether the strategic plan, the technology plan, or both were used as reference during budget planning as assessed by η^2 was .032, which indicated a small effect. The position within the college or

university accounted for 3.2% of the variance of the extent the strategic plan, the technology plan, or both were used as a reference during budget planning. The means and standard deviations for the four groups are reported in Table 50.

Table 50

Mean and Standard Deviation Extent Strategic or Technology Plan Was Used as a Reference During Budget Planning

Position	N	M	SD
Academic Administrator	30	2.00	1.02
Administrative Administrator	33	2.24	1.06
IT Administrator	17	2.53	1.23
Chair/Coordinator/Dean/Director	62	2.48	1.14
Totals	142	2.33	1.12

A one-way ANOVA was conducted to evaluate whether the technology plan, the strategic plan, or both were used as reference during budget planning among institutions measured in FTE enrollment. The ANOVA was not significant at the $p < .05$ level, $F(3,138) = 1.22$, $p = .305$. The strength of the relationship between size of the institution measured in FTE enrollment and whether the technology plan, the strategic plan, or both were used as reference during budget planning as assessed by η^2 was .026, which indicated a small effect. The position within the college or university accounted for 2.6% of the variance between the size of the institution measured in FTE enrollment on whether the technology plan, the strategic plan, or both were used as reference during budget planning. The means and standard deviations for the four groups are reported in Table 51.

Table 51

Mean and Standard Deviation Extent Strategic or Technology Plan Was Used as a Reference During Budget Planning

Institution Size	N	M	SD
<1,000 FTE	49	2.57	0.94
1,000-1,500 FTE	52	2.19	1.17
1,501-2,000	10	2.10	1.20
>2,000	31	2.26	1.24
Totals	142	2.33	1.12

A one-way ANOVA was conducted to evaluate the extent to which the strategic planning guidelines were helpful in achieving institutional vision among the positions within the institutions. The ANOVA was not significant at the $p < .05$ level, $F(3,138) = 2.09$, $p = .103$. The strength of the relationship between positions within the institutions and the extent to which the strategic planning guidelines were helpful in achieving institutional vision as assessed by η^2 was .044, which indicated a small effect. The position within the college or university accounted for 4.4% of the variance of the extent the strategic planning guidelines were helpful in achieving institutional vision. The means and standard deviations for the four groups are reported in Table 52.

Table 52

Mean and Standard Deviation Extent Strategic Planning Guidelines Were Helpful in Achieving Institutional Vision

Position	N	M	SD
Academic Administrator	30	1.93	1.08
Administrative Administrator	33	1.88	1.02
IT Administrator	17	2.29	0.92
Chair/Coordinator/Dean/Director	62	2.40	1.26
Totals	142	2.17	1.15

A one-way ANOVA was conducted to evaluate the extent to which the strategic planning guidelines at their institution were helpful in achieving institutional vision among the size of the institution measured in FTE enrollment. The ANOVA was significant at the $p < .05$ level, $F(3,138) = 4.55$, $p = .005$. Further testing using Tukey's post-hoc comparisons between the groups indicated that respondents within the <1,000 FTE institutions had a significant difference in opinion on the extent to which the strategic planning guidelines were helpful in achieving institutional vision at the $p < .05$ level, ($M = 1.98$, SD 1.08), $p = .024$. Tukey's post-hoc comparisons also indicated that respondents within the 1,501-2,000 FTE institutions had a significant difference in opinion on the extent to which the strategic planning guidelines were helpful in achieving institutional vision at the $p < .05$ level, ($M = 1.30$, SD 0.92), $p = .008$. Comparisons between the other two groups (1,000-1,500 and >2,000 FTE) showed no significant effect at the $p < .05$. The strength of the relationship within the size of the institution measured in FTE enrollment and the extent to which the strategic planning guidelines were helpful in achieving institutional vision as assessed by η^2 was .090, which indicated a medium to large

effect. The size of the institution measured in FTE enrollment accounted for 9.0% of the variance of the extent the strategic planning guidelines were helpful in achieving institutional vision. The means and standard deviations for the four groups are reported in Table 53.

Table 53

Mean and Standard Deviation Extent Strategic Planning Guidelines Were Helpful in Achieving Institutional Vision

Institution Size	N	M	SD
<1,000 FTE	49	1.98	1.05
1,000-1,500 FTE	52	2.17	1.10
1,501-2,000	10	1.40	0.70
>2,000	31	2.71	1.30
Totals	142	2.17	1.15

A one-way ANOVA was conducted to evaluate the extent to which the technology planning guidelines at their institution were helpful in achieving the technology initiatives among the positions within the institutions. The ANOVA was not significant at the $p < .05$ level, $F(3,138) = .344$, $p = .793$. The strength of the relationship between positions within the institutions and the extent to which the technology planning guidelines at their institution were helpful in achieving the technology initiatives as assessed by η^2 was .007, which indicated a very small effect. The position within the college or university accounted for only 0.7% of the variance of the extent the technology planning guidelines at their institutions were helpful in achieving the technology initiatives. The means and standard deviations for the four groups are reported in Table 54.

Table 54

Mean and Standard Deviation Extent Technology Planning Guidelines Were Helpful in Achieving Technology Initiatives

Position	N	M	SD
Academic Administrator	30	2.77	1.57
Administrative Administrator	33	2.61	1.25
IT Administrator	17	2.71	1.16
Chair/Coordinator/Dean/Director	62	2.90	1.46
Totals	142	2.78	1.40

A one-way ANOVA was conducted to evaluate the extent to which the technology planning guidelines at their institution were helpful in achieving the technology initiatives among the size of institutions measured in FTE enrollment. The ANOVA was not significant at the $p < .05$ level, $F(3,138) = 1.46$, $p = .229$. The strength of the relationship between the size of institutions measured in FTE enrollment and the extent to which the technology planning guidelines at their institution were helpful in achieving the technology initiatives as assessed by η^2 was .031, which indicated a small effect. The size of the institution measured in FTE enrollment accounted for 3.1% of the variance of the extent the technology planning guidelines at their institutions were helpful in achieving the technology initiatives. The means and standard deviations for the four groups are reported in Table 55.

Table 55

Mean and Standard Deviation Extent Technology Planning Guidelines Were Helpful in Achieving Technology Initiatives

Institution Size	N	M	SD
<1,000 FTE	49	2.88	1.62
1,000-1,500 FTE	52	2.65	1.20
1,501-2,000	10	2.10	0.99
>2,000	31	3.06	1.39
Totals	142	2.78	1.40

A one-way ANOVA was conducted to evaluate the extent to which the technology plan at their institution was aligned with the institutional strategic plan among the positions within the institutions. The ANOVA was not significant at the $p < .05$ level, $F(3,138) = .138$, $p = .937$. The strength of the relationship between positions within the institutions and the extent to which the technology plan at their institution was aligned with the institutional strategic plan as assessed by η^2 was .003, which indicated a very small effect. The position within the college or university accounted for only 0.3% of the variance of the extent the technology plan at their institution was aligned with the institutional strategic plan. The means and standard deviations for the four groups are reported in Table 56.

Table 56

Mean and Standard Deviation Extent Technology Plan Was Aligned with Institutional Strategic Plan

Position	N	M	SD
Academic Administrator	30	2.60	1.57
Administrative Administrator	33	2.39	1.25
IT Administrator	17	2.53	1.38
Chair/Coordinator/Dean/Director	62	2.56	1.43
Totals	142	2.53	1.40

A one-way ANOVA was conducted to evaluate the extent to which the technology plan at their institution was aligned with the institutional strategic plan among the size of institutions measured in FTE enrollment. The ANOVA was not significant at the $p < .05$ level, $F(3,138) = 1.81$, $p = .148$. The strength of the relationship between positions within the institutions and the extent to which the technology plan at their institution was aligned with the institutional strategic plan as assessed by η^2 was .038, which indicated a small effect. The size of the institution measured in FTE enrollment accounted for 3.8% of the variance of the extent the technology plan at their institution was aligned with the institutional strategic plan. The means and standard deviations for the four groups are reported in Table 57.

Table 57

Mean and Standard Deviation Extent Technology Plan Was Aligned with Institutional Strategic Plan

Institution Size	N	M	SD
<1,000 FTE	49	2.69	1.56
1,000-1,500 FTE	52	2.48	1.34
1,501-2,000	10	1.60	0.52
>2,000	31	2.65	1.38
Totals	142	2.53	1.40

A one-way ANOVA was conducted to evaluate the extent to which the strategic plan and the technology plan were appropriately funded by the budget among the positions within the institutions. The ANOVA was not significant at the $p < .05$ level, $F(3,138) = .578$, $p = .630$. The strength of the relationship between positions within the institutions and the extent to which the strategic plan and the technology plan were appropriately funded by the budget as assessed by η^2 was .012, which indicated a small effect. The position within the college or university accounted for 1.2% of the variance of the extent the strategic plan and the technology plan were appropriately funded by the budget. The means and standard deviations for the four groups are reported in Table 58.

Table 58

Mean and Standard Deviation Extent Strategic or Technology Plan Were Funded by Budget

Position	N	M	SD
Academic Administrator	30	2.33	1.16
Administrative Administrator	33	2.48	1.03
IT Administrator	17	2.76	1.03
Chair/Coordinator/Dean/Director	62	2.56	1.20
Totals	142	2.52	1.13

A one-way ANOVA was conducted to evaluate the extent to which the strategic plan and the technology plan were appropriately funded by the budget among the size of institutions measured in FTE enrollment. The ANOVA was significant at the $p < .05$ level, $F(3,138) = 6.78$, $p < .01$. Further testing using Tukey's post-hoc comparisons between the groups indicated that respondents within the 1,000 - 1,500 FTE institutions had a significant difference in opinion on the extent to which the strategic plan and the technology plan were appropriately funded by the budget at the $p < .05$ level, ($M = 2.56$, SD 1.02), $p = .001$. Tukey's post-hoc comparisons also indicated that respondents within the 1,501-2,000 FTE institutions had a significant difference in opinion on the extent to which the strategic plan and the technology plan were appropriately funded by the budget at the $p < .05$ level, ($M = 1.10$, SD 0.32), $p = .001$. Tukey's post-hoc comparisons also indicated that respondents within the >2,000 FTE institutions had a significant difference in opinion on the extent to which the strategic plan and the technology plan were appropriately funded by the budget at the $p < .05$ level, ($M = 2.81$, SD 1.05), $p < .01$. Comparisons between the respondents within the <1,000 showed no significant effect at the $p <$

.05 level. The strength of the relationship between the size of institutions measured in FTE enrollment and the extent to which the strategic plan and the technology plan were appropriately funded by the budget as assessed by η^2 was .128, which indicated a large effect. The size of the institution measured in FTE enrollment accounted for 12.8% of the variance of the extent the strategic plan and the technology plan were appropriately funded by the budget. The means and standard deviations for the four groups are reported in Table 59.

Table 59

Mean and Standard Deviation Extent Strategic or Technology Plan Were Funded by Budget

Institution Size	N	M	SD
<1,000 FTE	49	2.59	1.21
1,000-1,500 FTE	52	2.56	1.02
1,501-2,000	10	1.10	0.32
>2,000	31	2.81	1.05
Totals	142	2.52	1.13

A one-way ANOVA was conducted to evaluate how often the strategic planning document at their institution was used as a vehicle for communicating the technology needs of the institution among the positions within the institutions. The ANOVA was not significant at the $p < .05$ level, $F(3,138) = 1,71$, $p = .167$. The strength of the relationship between positions within the institutions and how often the strategic planning document was used as a vehicle for communicating the technology needs of the institution as assessed by η^2 was .036, which indicated a small effect. The position within the college or university accounted for 3.6% of the variance of how often the strategic planning document was used as a vehicle for communicating

the technology needs of the institution. The means and standard deviations for the four groups are reported in Table 60.

Table 60

Mean and Standard Deviation How Often Strategic Planning Document Was Used to Communicate Technology Needs

Position	N	M	SD
Academic Administrator	30	3.13	1.38
Administrative Administrator	33	2.76	1.30
IT Administrator	17	3.35	1.45
Chair/Coordinator/Dean/Director	62	3.40	1.36
Totals	142	3.19	1.37

A one-way ANOVA was conducted to evaluate how often the strategic planning document at their institution was used as a vehicle for communicating the technology needs of the institution among the size of institutions measured in FTE enrollment. The ANOVA was not significant at the $p < .05$ level, $F(3,138) = 1.20$, $p = .312$. The strength of the relationship between the size of institutions measured in FTE enrollment and how often the strategic planning document at their institution was used as a vehicle for communicating the technology needs of the institution as assessed by η^2 was .025, which indicated a small effect. The size of the institution measured in FTE enrollment accounted for 2.5% of the variance of how often the strategic planning document at their institution was used as a vehicle for communicating the technology needs of the institution. The means and standard deviations for the four groups are reported in Table 61.

Table 61

Mean and Standard Deviation How Often Strategic Planning Document Was Used to Communicate Technology Needs

Institution Size	N	M	SD
<1,000 FTE	49	3.12	1.52
1,000-1,500 FTE	52	3.13	1.16
1,501-2,000	10	2.70	1.16
>2,000	31	3.55	1.50
Totals	142	3.19	1.37

A one-way ANOVA was conducted to evaluate how often the technology planning document at their institution was used as a vehicle for communicating the technology needs of the institution among the positions within the institutions. The ANOVA was not significant at the $p < .05$ level, $F(3,138) = .814$, $p = .488$. The strength of the relationship between positions within the institutions and how often the technology planning document at their institution was used as a vehicle for communicating the technology needs of the institution as assessed by η^2 was .017, which indicated a small effect. The position within the college or university accounted for 1.7% of the variance of how often the technology planning document at their institution was used as a vehicle for communicating the technology needs of the institution. The means and standard deviations for the four groups are reported in Table 62.

Table 62

Mean and Standard Deviation How Often the Technology Planning Document Was Used to Communicate Technology Needs

Position	N	M	SD
Academic Administrator	30	3.73	1.78
Administrative Administrator	33	3.12	1.50
IT Administrator	17	3.41	1.46
Chair/Coordinator/Dean/Director	62	3.47	1.52
Totals	142	3.44	1.56

A one-way ANOVA was conducted to evaluate how often the technology planning document at their institution was used as a vehicle for communicating the technology needs of the institution among the size of institutions measured in FTE enrollment. The ANOVA was not significant at the $p < .05$ level, $F(3,138) = 2.23$, $p = .088$. The strength of the relationship between the size of institutions measured in FTE enrollment and how often the technology planning document at their institution was used as a vehicle for communicating the technology needs of the institution as assessed by η^2 was .046, which indicated a small effect. The position within the college or university accounted for 4.6% of the variance of how often the technology planning document at their institution was used as a vehicle for communicating the technology needs of the institution. The means and standard deviations for the four groups are reported in Table 63.

Table 63

Mean and Standard Deviation How Often the Technology Planning Document Was Used to Communicate Technology Needs

Institution Size	N	M	SD
<1,000 FTE	49	3.55	1.84
1,000-1,500 FTE	52	3.19	1.40
1,501-2,000	10	2.70	1.16
>2,000	31	3.90	1.35
Totals	142	3.44	1.56

A one-way ANOVA was conducted to test how often technology was used as a strategy for achieving institutional goals among the positions within the institutions. The ANOVA was not significant at the $p < .05$ level, $F(3,138) = .044$, $p = .988$. The strength of the relationship between positions within the institutions and how often technology was used as a strategy for achieving institutional goals as assessed by η^2 was .001, which indicated a very small effect. The position within the college or university accounted for only 0.1% of the variance of how often technology was used as a strategy for achieving institutional goals. The means and standard deviations for the four groups are reported in Table 64.

Table 64

Mean and Standard Deviation How Often Technology Was Used for a Strategy to Achieve Institutional Goals

Position	N	M	SD
Academic Administrator	30	2.73	1.34
Administrative Administrator	33	2.73	1.04
IT Administrator	17	2.82	1.19
Chair/Coordinator/Dean/Director	62	2.79	1.10
Totals	142	2.77	1.14

A one-way ANOVA was conducted to evaluate how often the strategic planning document was used as a vehicle for communicating the technology needs of the institution among the size of institutions measured in FTE enrollment. The ANOVA was not significant at the $p < .05$ level, $F(3,138) = 2.51$, $p = .061$. The strength of the relationship between the size of institutions measured in FTE enrollment and how often technology was used as a strategy for achieving institutional goals as assessed by η^2 was .052 which indicated a small to slightly medium effect. The size of the institution measured in FTE enrollment accounted for a 5.2% of the variance of how often technology was used as a strategy for achieving institutional goals. The means and standard deviations for the four groups are reported in Table 65.

Table 65

Mean and Standard Deviation How Often Technology Was Used as a Strategy for Achieving Institutional Goals

Institution Size	N	M	SD
<1,000 FTE	49	2.94	1.34
1,000-1,500 FTE	52	2.63	0.99
1,501-2,000	10	2.00	0.67
>2,000	31	2.97	1.05
Totals	142	2.77	1.14

Research Question 2

I used survey questions 18, 20, and 21 to test the hypotheses for Research Question 2; to what extent are faculty administrators involved in planning for technology in institutions that are members of the ACA consortium.

A one-way ANOVA was conducted to evaluate the extent to which department chairs, coordinators, deans, or directors were involved in budget planning among the positions within the institutions. The ANOVA was not significant at the $p < .05$ level, $F(3,138) = 1.75$, $p = .160$. The strength of the relationship between positions within the institutions and the extent to which department chairs, coordinators, deans, or directors were involved in budget planning as assessed by η^2 was .037, which indicated a small effect. The position within the college or university accounted for 3.7% of the variance of the extent department chairs, coordinators, deans, or directors were involved in budget planning. The means and standard deviations for the four groups are reported in Table 66.

Table 66

Mean and Standard Deviation Extent Second-level Administrators Were Involved in Budget Planning

Position	N	M	SD
Academic Administrator	30	2.03	0.93
Administrative Administrator	33	1.76	0.75
IT Administrator	17	2.35	1.12
Chair/Coordinator/Dean/Director	62	2.02	0.86
Totals	142	2.00	0.89

A one-way ANOVA was conducted to evaluate the extent to which department chairs, coordinators, deans, or directors were involved in budget planning among the size of institutions measured in FTE enrollment. The ANOVA was not significant at the $p < .05$ level, $F(3,138) = 2.53$, $p = .059$. The strength of the relationship between the size of institutions measured in FTE enrollment and the extent to which department chairs, coordinators, deans, or directors were involved in budget planning as assessed by η^2 was .052, which indicated a small to slightly medium effect. The size of the institution measured in FTE enrollment accounted for 5.2% of the variance of the extent department chairs, coordinators, deans, or directors were involved in budget planning. The means and standard deviations for the four groups are reported in Table 67.

Table 67

Mean and Standard Deviation Extent Second-level Administrators Were Involved in Budget Planning

Institution Size	N	M	SD
<1,000 FTE	49	2.10	0.98
1,000-1,500 FTE	52	2.08	0.79
1,501-2,000	10	1.30	0.48
>2,000	31	1.94	0.93
Totals	142	2.00	0.89

A one-way ANOVA was conducted to test how often the first-level academic administrators were relied on for guidance in helping to determine how technology was used as a strategy to accomplish planning goals among the positions within the institutions. The ANOVA was significant at the $p < .05$ level, $F(3,138) = 2.92$, $p = .036$. However, further testing using Tukey's post-hoc comparisons of the four groups indicated there was no significant effect between the groups at $p < .05$. The strength of the relationship between positions within the institutions and how often the first-level academic administrators were relied on for guidance in helping to determine how technology was used as a strategy to accomplish planning goals as assessed by η^2 was .042, which indicated a small effect. The position within the college or university accounted for 4.2% of the variance of how often first-level academic administrators were relied on for guidance in helping to determine how technology was used as a strategy to accomplish planning goals. The means and standard deviations for the four groups are reported in Table 68.

Table 68

Mean and Standard Deviation How Often Were First-level Administrators Relied on for Guidance

Position	N	M	SD
Academic Administrator	30	2.37	1.40
Administrative Administrator	33	2.21	1.02
IT Administrator	17	2.82	1.07
Chair/Coordinator/Dean/Director	62	2.81	1.40
Totals	142	2.58	1.30

A one-way ANOVA was conducted to evaluate how often the first-level academic administrators were relied upon for guidance in helping to determine how technology was used as a strategy to accomplish planning goals among the size of institutions measured in FTE enrollment. The ANOVA was not significant at the $p < .05$ level, $F(3,138) = .138$, $p = .937$. The strength of the relationship the size of institutions measured in FTE enrollment and how often the first-level academic administrators were relied on for guidance in helping to determine how technology was used as a strategy to accomplish planning goals as assessed by η^2 was .003, which indicated a very small effect. The position within the college or university accounted for only 0.3% of the variance of how often first-level academic administrators were relied on for guidance in helping to determine how technology was used as a strategy to accomplish planning goals. The means and standard deviations for the four groups are reported in Table 69.

Table 69

Mean and Standard Deviation How Often Were First-level Administrators Relied on for Guidance

Institution Size	N	M	SD
<1,000 FTE	49	2.59	1.50
1,000-1,500 FTE	52	2.54	1.22
1,501-2,000	10	2.40	1.58
>2,000	31	2.68	1.01
Totals	142	2.58	1.30

A one-way ANOVA was conducted to evaluate how often department chairs, coordinators, deans, or directors were relied upon for guidance in helping to determine how technology was used as a strategy to accomplish planning goals among the positions within the institutions. The ANOVA was not significant at the $p < .05$ level, $F(3,138) = .616$, $p = .606$. The strength of the relationship between positions within the institutions and how often department chairs, coordinators, deans, or directors were relied upon for guidance in helping to determine how technology was used as a strategy to accomplish planning goals as assessed by η^2 was .013, which indicated a small effect. The position within the college or university accounted for 1.3% of the variance of how often department chairs, coordinators, deans, or directors were relied upon for guidance in helping to determine how technology was used as a strategy to accomplish planning goals. The means and standard deviations for the four groups are reported in Table 70.

Table 70

Mean and Standard Deviation How Often Were Second-level Administrators Relied on for Guidance

Position	N	M	SD
Academic Administrator	30	2.87	1.28
Administrative Administrator	33	2.73	1.15
IT Administrator	17	2.59	0.87
Chair/Coordinator/Dean/Director	62	2.95	1.06
Totals	142	2.84	1.11

A one-way ANOVA was conducted to evaluate how often department chairs, coordinators, deans, or directors were relied upon for guidance in helping to determine how technology was used as a strategy to accomplish planning goals among the size of institutions measured in FTE enrollment. The ANOVA was not significant at the $p < .05$ level, $F(3,138) = .599$, $p = .617$. The strength of the relationship between the size of institutions measured in FTE enrollment and how often department chairs, coordinators, deans, or directors were relied upon for guidance in helping to determine how technology was used as a strategy to accomplish planning goals as assessed by η^2 was .013, which indicated a small effect. The position within the college or university accounted for 1.3% of the variance of how often department chairs, coordinators, deans, or directors were relied upon for guidance in helping to determine how technology was used as a strategy to accomplish planning goals. The means and standard deviations for the four groups are reported in Table 71.

Table 71

Mean and Standard Deviation How Often Were Second-level Administrators Relied on for Guidance

Institution Size	N	M	SD
<1,000 FTE	49	2.82	1.25
1,000-1,500 FTE	52	2.73	1.05
1,501-2,000	10	2.80	0.92
>2,000	31	3.06	1.03
Totals	142	2.84	1.11

Research Question 3

I used the same survey questions (18, 20, and 21) that were used to test Research Question 2 to test the hypotheses for Research Question 3; to what extent are staff administrators involved in planning for technology in institutions that are members of the ACA consortium. The results can be reviewed on page 115, see Research Question 2.

Research Question 4

I used survey questions 19 and 20 to test the hypotheses for Research Question 4; to what extent are information technology leaders involved in strategic planning in institutions that are members of the ACA consortium.

A one-way ANOVA was conducted to test how often the first-level technology administrator is relied upon for guidance in helping to determine how technology was used as a strategy to accomplish planning goals among the positions within the institutions. The ANOVA

was not significant at the $p < .05$ level, $F(3,138) = 2.02$, $p = .115$. The strength of the relationship between positions within the institutions and how often the first-level technology administrator is relied upon for guidance in helping to determine how technology was used as a strategy to accomplish planning goals as assessed by η^2 was .023, which indicated a small effect. The position within the college or university accounted for 2.3% of the variance of how often the first-level technology administrator is relied upon for guidance in helping to determine how technology was used as a strategy to accomplish planning goals. The means and standard deviations for the four groups are reported in Table 72.

Table 72

Mean and Standard Deviation How Often Were IT Administrators Relied on for Guidance

Position	N	M	SD
Academic Administrator	30	2.40	1.35
Administrative Administrator	33	2.42	1.44
IT Administrator	17	2.59	1.21
Chair/Coordinator/Dean/Director	62	2.87	1.52
Totals	142	2.63	1.43

A one-way ANOVA was conducted to evaluate how often the first-level technology administrator is relied upon for guidance in helping to determine how technology was used as a strategy to accomplish planning goals among the size of institutions measured in FTE enrollment. The ANOVA was not significant at the $p < .05$ level, $F(3,138) = .958$, $p = .415$. The strength of the relationship between the size of institutions measured in FTE enrollment and how often the first-level technology administrator is relied upon for guidance in helping to determine

how technology was used as a strategy to accomplish planning goals as assessed by η^2 was .020, which indicated a small effect. The size of the institution measured in FTE enrollment accounted for 2.0% of the variance of how often the first-level technology administrator is relied upon for guidance in helping to determine how technology was used as a strategy to accomplish planning goals. The means and standard deviations for the four groups are reported in Table 73.

Table 73

Mean and Standard Deviation How Often Were IT Administrators Relied on for Guidance

Institution Size	N	M	SD
<1,000 FTE	49	2.82	1.73
1,000-1,500 FTE	52	2.40	1.22
1,501-2,000	10	2.40	1.51
>2,000	31	2.81	1.17
Totals	142	2.63	1.43

A one-way ANOVA was conducted to evaluate how often the first-level academic administrators were relied on for guidance in helping to determine how technology was used as a strategy to accomplish planning goals among the positions within the institutions. The ANOVA was significant at the $p < .05$ level, $F(3,138) = 2.92$, $p = .036$. However, further testing using Tukey's post-hoc comparisons of the four groups indicated there was no significant effect between the groups at $p < .05$. The strength of the relationship between positions within the institutions and how often the first-level academic administrators were relied on for guidance in helping to determine how technology was used as a strategy to accomplish planning goals as assessed by η^2 was .042, which indicated a small effect. The position within the college or

university accounted for 4.2% of the variance of how often first-level academic administrators were relied on for guidance in helping to determine how technology was used as a strategy to accomplish planning goals. The means and standard deviations for the four groups are reported in Table 74.

Table 74

Mean and Standard Deviation How Often Were First-level Administrators Relied on for Guidance

Position	N	M	SD
Academic Administrator	30	2.37	1.40
Administrative Administrator	33	2.21	1.02
IT Administrator	17	2.82	1.07
Chair/Coordinator/Dean/Director	62	2.81	1.40
Totals	142	2.58	1.30

A one-way ANOVA was conducted to evaluate how often the first-level academic administrators were relied upon for guidance in helping to determine how technology was used as a strategy to accomplish planning goals among the size of institutions measured in FTE enrollment. The ANOVA was not significant at the $p < .05$ level, $F(3,138) = .138$, $p = .937$. The strength of the relationship between the size of institutions measured in FTE enrollment and how often the first-level academic administrators were relied on for guidance in helping to determine how technology was used as a strategy to accomplish planning goals as assessed by η^2 was .003, which indicated a very small effect. The position within the college or university accounted for only 0.3% of the variance of how often first-level academic administrators were relied on for

guidance in helping to determine how technology was used as a strategy to accomplish planning goals. The means and standard deviations for the four groups are reported in Table 75.

Table 75

Mean and Standard Deviation How Often Were First-level Administrators Relied on for Guidance

Institution Size	N	M	SD
<1,000 FTE	49	2.59	1.50
1,000-1,500 FTE	52	2.54	1.22
1,501-2,000	10	2.40	1.58
>2,000	31	2.68	1.01
Totals	142	2.58	1.30

Research Question 5

To what extent do institutional budget considerations align with strategic planning for technology in institutions that are members of the ACA consortium. I used survey questions 13, 17, and 18 to test the hypotheses for Research Question 5.

A one-way ANOVA was conducted to evaluate whether the strategic plan, the technology plan or both were used as reference during budget planning among the positions within the institutions. The ANOVA was not significant at the $p < .05$ level, $F(3,138) = 1.54$, $p = .208$. The strength of the relationship between positions within the institutions and whether the strategic plan, the technology plan, or both were used as reference during budget planning as assessed by η^2 was .032, which indicated a small effect. The position within the college or university accounted for 3.2% of the variance of whether the strategic plan, the technology plan,

or both were used as a reference during budget planning. The means and standard deviations for the four groups are reported in Table 76.

Table 76

Mean and Standard Deviation Strategic or Technology Plan Was Used as a Reference During Budget Planning

Position	N	M	SD
Academic Administrator	30	2.00	1.02
Administrative Administrator	33	2.24	1.06
IT Administrator	17	2.53	1.23
Chair/Coordinator/Dean/Director	62	2.48	1.14
Totals	142	2.33	1.12

A one-way ANOVA was conducted to evaluate whether the technology plan, the strategic plan or both were used as reference during budget planning among the size of institutions measured in FTE enrollment. The ANOVA was not significant at the $p < .05$ level, $F(3,138) = 1.22$, $p = .305$. The strength of the relationship between the size of institutions measured in FTE enrollment and whether the technology plan, the strategic plan, or both were used as reference during budget planning as assessed by η^2 was .026, which indicated a small effect. The size of the institution measured in FTE enrollment accounted for a 2.6% of the variance of whether the technology plan, the strategic plan, or both were used as reference during budget planning. The means and standard deviations for the four groups are reported in Table 77.

Table 77

Mean and Standard Deviation Extent Strategic or Technology Plan Was Used as a Reference During Budget Planning

Institution Size	N	M	SD
<1,000 FTE	49	2.57	0.94
1,000-1,500 FTE	52	2.19	1.17
1,501-2,000	10	2.10	1.20
>2,000	31	2.26	1.24
Totals	142	2.33	1.12

A one-way ANOVA was conducted to evaluate the extent to which the strategic plan and the technology plan were appropriately funded by the budget among the positions within the institutions. The ANOVA was not significant at the $p < .05$ level, $F(3,138) = .578$, $p = .630$. The strength of the relationship between positions within the institutions and the extent to which the strategic plan and the technology plan were appropriately funded by the budget as assessed by η^2 was .012, which indicated a small effect. The position within the college or university accounted for 1.2% of the variance of the extent the strategic plan and the technology plan were appropriately funded by the budget. The means and standard deviations for the four groups are reported in Table 78.

Table 78

Mean and Standard Deviation Extent Strategic and Technology Plan Were Funded by Budget

Position	N	M	SD
Academic Administrator	30	2.33	1.16
Administrative Administrator	33	2.48	1.03
IT Administrator	17	2.76	1.03
Chair/Coordinator/Dean/Director	62	2.56	1.20
Totals	142	2.52	1.13

A one-way ANOVA was conducted to test the extent to which the strategic plan and the technology plan were appropriately funded by the budget among size of institutions measured in FTE enrollment. The ANOVA was significant at the $p < .05$ level, $F(3,138) = 6.78$, $p < .01$. Further testing using Tukey's post-hoc comparisons between the groups indicated that respondents within the 1,000 - 1,500 FTE institutions had a significant difference in opinion on the extent to which the strategic plan and the technology plan were appropriately funded by the budget at the $p < .05$ level, ($M = 2.56$, SD 1.02), $p = .001$. Tukey's post-hoc comparisons also indicated that respondents within the 1,501-2,000 FTE institutions had a significant difference in opinion on the extent to which the strategic plan and the technology plan were appropriately funded by the budget at the $p < .05$ level, ($M = 1.10$, SD 0.32), $p = .001$. Tukey's post-hoc comparisons also indicated that respondents within the >2,000 FTE institutions had a significant difference in opinion on the extent to which the strategic plan and the technology plan were appropriately funded by the budget at the $p < .05$ level, ($M = 2.81$, SD 1.05), $p < .01$. Comparisons between the respondents within the <1,000 showed no significant effect at the $p <$

.05 level. The strength of the relationship between the size of institutions measured in FTE enrollment and the extent to which the strategic plan and the technology plan were appropriately funded by the budget as assessed by η^2 was .128, which indicated a large effect. The size of the institution measured in FTE enrollment accounted for a 12.8% of the variance of the extent the strategic plan and the technology plan were appropriately funded by the budget. The means and standard deviations for the four groups are reported in Table 79.

Table 79

Mean and Standard Deviation Extent Strategic Plan and Technology Plan Were Funded by Budget

Institution Size	N	M	SD
<1,000 FTE	49	2.59	1.21
1,000-1,500 FTE	52	2.56	1.02
1,501-2,000	10	1.10	0.32
>2,000	31	2.81	1.05
Totals	142	2.52	1.13

A one-way ANOVA was conducted to test the extent to which department chairs, coordinators, deans, or directors were involved in budget planning among the positions within the institutions. The ANOVA was not significant at the $p < .05$ level, $F(3,138) = 1.75$, $p = .160$. The strength of the relationship between positions within the institutions and the extent to which department chairs, coordinators, deans, or directors were involved in budget planning as assessed by η^2 was .037, which indicated a small effect. The position within the college or university accounted for 3.7% of the variance of the extent department chairs, coordinators, deans, or

directors were involved in budget planning. The means and standard deviations for the four groups are reported in Table 80.

Table 80

Mean and Standard Deviation Extent Second-level Administrators Were Involved in Budget Planning

Position	N	M	SD
Academic Administrator	30	2.03	0.93
Administrative Administrator	33	1.76	0.75
IT Administrator	17	2.35	1.12
Chair/Coordinator/Dean/Director	62	2.02	0.86
Totals	142	2.00	0.89

A one-way ANOVA was conducted to evaluate the extent to which department chairs, coordinators, deans, or directors were involved in budget planning among the size of institutions measured in FTE enrollment. The ANOVA was not significant at the $p < .05$ level, $F(3,138) = 2.53$, $p = .059$. The strength of the relationship between the size of institutions measured in FTE enrollment and the extent to which department chairs, coordinators, deans, or directors were involved in budget planning as assessed by η^2 was .052, which indicated a small to slightly medium effect. The position within the college or university accounted for 5.2% of the variance of the extent department chairs, coordinators, deans, or directors were involved in budget planning. The means and standard deviations for the four groups are reported in Table 81.

Table 81

Mean and Standard Deviation Extent Second-level Administrators Were Involved in Budget Planning

Institution Size	N	M	SD
<1,000 FTE	49	2.10	0.98
1,000-1,500 FTE	52	2.08	0.79
1,501-2,000	10	1.30	0.48
>2,000	31	1.94	0.93
Totals	142	2.00	0.89

I used Pearson's Chi-Square test for Question 25 because the values for variables in this question were dichotomous to evaluate the difference between the four groups of position within the institution regarding which scenario best described their institution as related to technology planning and the budget. The test results indicated that there was a violation in the assumptions made by the test because 13 cells (54.2%) had expected count results less than five indicating that there was not enough variation among the results to make an assumption of the probability of the test at $X^2(15, N = 190) = 17.97$, $p = .265$. The results were similar for the difference between the four groups of institutions based size as measured by FTE enrollment. The test results indicated that there was a violation in the assumptions made by the test because 14 cells (58.3%) had expected count results less than five indicating that there was not enough variation among the results to make an assumption of the probability of the test at $X^2(15, N = 190) = 12.13$, $p = .669$.

The crosstab results indicated that most of the technology dollars were spent to either purchase technology to upgrade student computer labs and faculty and staff computers or to purchase technology

for classroom instruction. Academic administrators responded 46% that their institution budgeted for and purchased new technology for classroom instruction and 33% to purchase technology to upgrade student computer labs and faculty and staff computers. Administrative administrators responded 43% that their institution budgeted to purchase technology to upgrade student computer labs and faculty and staff computers and 39% to purchase new technology for classroom instruction. IT administrators responded 48% that their institution budgeted to purchase technology to upgrade student computer labs and faculty and staff computers and 28% to purchase new technology for classroom instruction. Department chairs, coordinators, deans, or directors responded 38% that their institution budgeted for and purchased new technology for classroom instruction and 34% to purchase technology to upgrade student computer labs and faculty and staff computers.

The responses based on size of the intuition measured in FTE enrollment were very similar with consensus that technology dollars were spent to upgrade student computer labs and faculty and staff computers or to purchase technology for classroom instruction. Institutions with FTE less than 1,000 responded 43% that their institution budgeted for and purchased technology to upgrade student computer labs and faculty and staff computers and 34% to purchase new technology for classroom instruction. Institutions with FTE between 1,000 and 1,500 responded 42% that their institution budgeted for and purchased technology to upgrade student computer labs and faculty and staff computers and 38% to purchase new technology for classroom instructions. Institutions with FTE between 1,501 and 2,000 responded 60% that their institution budgeted to purchase new technology for classroom instruction and 33% to purchase technology to upgrade student computer labs and faculty and staff computers. Institutions that had an enrollment greater than 2,000 FTE responded 40% that their institution budgeted to

purchase new technology for classroom instruction and 26% to purchase technology to upgrade student computer labs and faculty and staff computers.

CHAPTER 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This chapter offers a summary of the research described and the results that are presented in Chapter 4. It offers conclusions based on the results from Chapter 4. It also presents the conclusions drawn from the study and makes recommendations for possible areas for further research.

The purpose of this study was to determine if the technology initiatives were appropriately aligned to institutional strategic plans and whether these planning documents were used effectively to communicate technology needs in the ACA institutions. There were 25 survey questions used to obtain research data. Questions 1 and 2 were used to gather demographic data and were used as the predictor variables. Additional variables that were gathered from the online survey from questions 3 through 25 included participants perception of their role in both technology and strategic planning, participants perception of the role of IT in strategic planning, participants perception of the role of academic and administrative personnel in technology planning, and participants perception of how affective strategic and technology planning are used to communicate technology needs for the institution.

The following section presents a summary of the findings. Succeeding sections will include conclusions and recommendations drawn from the study.

Summary of Findings

The demographic findings of this study show 21.1% of the 142 respondents were academic administrators at their institution, 23.2% were administrative administrators, 12.0% were IT administrators, and the remaining 43.7% were department chairs, coordinators, deans, or

directors at their institution. Thirty-four and a half percent of the respondents were employed at institutions that had an enrollment of less than 1,000 FTE, 36.6% were employed at institutions with enrollment between 1,000 and 1,500 FTE, 7.1 % were employed at institutions with enrollment between 1,501 and 2,000 FTE, and the remaining 21.8% were employed at institutions with enrollment greater than 2,000 FTE. The goal was to achieve balance between first-level administrators which included academic, administrative, and IT and the second-level administrators, which included department chairs, coordinators, deans, or directors. That goal was achieved with 56% of the respondents as first-level administrators and 44% as second-level administrators.

The demographic section of the survey revealed that the majority of the institutions had documented strategic planning guidelines at their institutions; however, the number of institutions that had documented technology planning guidelines was lower. Ninety percent of the academic administrators reported documented strategic planning guidelines at their institutions; however, only 57% of the academic administrators reported documented technology planning guidelines at their institutions. Eighty-five percent of the administrative administrators reported documented strategic planning guidelines; however, only 61% reported technology planning guidelines. IT administrators reported 65% there were documented strategic planning guidelines; however, only 42% reported documented technology planning guidelines. Finally 92% of the department chairs, coordinators, deans, or directors reported their institutions had documented strategic planning guidelines, but only 53% reported their institutions had documented technology planning guidelines.

Questions 7 and 12 were used to evaluate whether the technology plan and the strategic plan were available respectfully for the strategic planning committee and the technology

planning committee. The majority of the respondents stated the strategic plan was available and used for reference by the members of the technology planning committee. Eighty percent of the academic administrators responded yes, 91% of the administrative administrators responded yes, 59% of the IT administrators responded yes, and 82% of the department chairs, coordinators, deans, or directors responded yes. It was interesting that 41% of the IT administrators responded the strategic plan was not available and used for reference by the members of the technology planning committee. Regarding whether the technology plan was available and used for reference by the members of the strategic planning committee, the results were significantly lower with the lowest percent reported by IT administrators. Sixty-seven percent of the academic administrators responded the technology plan was available, 64% of the administrative administrators agreed, 41% of the IT administrators also agreed, and 61% of the department chairs, coordinators, deans, or directors concurred. Fifty-nine percent of the IT administrators responded the technology plan was not available and used as a reference by the members of the strategic planning committee.

Survey questions 4 and 9 were used to determine if the mission, values, and goals of the institution were easily identified and recognized and whether the technology initiatives were easily identified and recognized. Clearly the results indicated the mission, values, and goals were much more easily identified and recognized than the technology initiatives. Eighty-seven percent of academic administrators stated the mission, values, and goals of the institution were easily identified and recognized, while only 60% indicated the technology initiatives were easily identified and recognized. The results were similar for administrative administrators with 100% responding the mission, values, and goals were easily identified and recognized but only 52% responded the technology initiatives were easily identified and recognized. Eighty-two percent

of IT administrators reported the mission, values and goals were easily identified and recognized but only 53% reported the technology initiatives were easily identified and recognized. Eighty-four percent of the department chairs, coordinators, deans, or directors responded the mission, goals, and values are easily recognized and 47% responded the technology initiatives were easily identified and recognized.

There were four questions on the survey that were used to determine who was involved in the technology and strategic planning processes. Survey questions 5 and 6 related to whether IT administrators and department chairs, coordinators, deans, or directors were represented on the strategic planning committee. Questions 10 and 11 related to whether academic and administrative administrators, and department chairs, coordinators, deans, or directors were represented on the technology planning committee. A total of 83% of the academic administrators reported department chairs, coordinators, deans, or directors were represented on the strategic planning committee; only 63% of the academic administrators responded department chairs, coordinators, deans, or directors were represented on the technology planning committee. Eighty-four percent of the administrative administrators responded department chairs, coordinators, deans, or directors were represented on the strategic planning committee; while 48% of the administrative administrators responded department chairs, coordinators, deans, or directors were represented on the technology planning committee. Seventy-one percent of the IT administrators indicated department chairs, coordinators, deans, or directors were represented on the strategic planning committee, and 65% of the IT administrators indicated department chairs, coordinators, deans, or directors were represented on the technology planning committee. Eighty-four percent of the department chairs, coordinators, deans, or directors responded they were represented on the strategic planning committee, and 53% of the

department chairs, coordinators, deans, or directors responded they were represented on the technology planning committee.

In regard to whether the IT administers were represented on the strategic planning committee 70% of the academic administrators responded their IT administrator was represented on the strategic planning committee, 79% of the administrative administrators agreed, 47% of the IT administrators also agreed, and 69% of the department chairs, coordinators, deans, or directors concurred. In regard to whether first-level administrators, both academic and administrative, were represented on the technology planning committee 77% of the academic administrators responded first-level administrators were represented, 64% of the administrative administrators agreed, and 53% of the IT administrators agreed, as well as 64% of the department chairs, coordinators, deans, or directors.

Findings Related to Research Question 1

The first of five research questions, to what extent is technology an integral component of the strategic planning process in ACA institutions was tested using the following two null hypotheses, there is no difference among the positions of administrators regarding the perception that technology is an integral component of the strategic planning process in institutions that are members of the ACA consortium; and there is no relationship based on the size of the institution measured in FTE enrollment regarding the perception that technology is an integral component of the strategic planning process in institutions that are members of the ACA consortium. I used the statistical results from survey questions 13, 14, 15, 16, 17, 22, 23, 24 to test the hypotheses for Research Question 1. The statistical data indicated there was no significant difference among the positions that technology is an integral component of the strategic planning process within

institutions that are members of the ACA consortium. All of the survey questions used to theorize Research Question 1 for differences among the positions of administrators showed no significant differences between the four groups.

The same questions were used to theorize based on the size of the institution measured in FTE enrollment. Only 1 of the 8 survey questions showed any difference between the four groups. Survey question 14 indicated there was a significant difference on the extent to which the strategic planning guidelines at their institutions were helpful in achieving institutional vision. Additional testing on the data indicated that respondents who were employed by institutions less than 1,000 and those employed by institutions between 1,501 and 2,000 had a significant difference of opinion. The crosstab results supported the finding with respondents in the less 1,000 FTE reporting that 72% agreed the strategic planning guidelines were helpful in achieving the institutional vision, respondents in the group 1,501 to 2,000 agreed reporting 90% agreed; in contrast, only 60% in the group 1,000 to 1,500 agreed, while 52% in the group greater than 2,000 agreed. I used the collective analyses of all of the survey questions designated to theorize Research Question 1. There were no significant differences based on $p > .05$ results for seven of the eight survey questions so the null hypotheses were retained indicating there is no difference among the positions of administrators regarding the perception that technology is an integral component of the strategic planning process in institutions that are members of the ACA consortium, and there is no relationship based on the size of the institution measured in FTE enrollment regarding the perception that technology is an integral component of the strategic planning process in institutions that are members of the ACA consortium.

Findings Related to Research Question 2

Research Question 2, to what extent are faculty administrators involved in planning for technology in institutions that are members of the ACA consortium was tested using the following null hypotheses, there is no difference between and among the positions of administrators that faculty administrators are involved in planning for technology in institutions that are members of the ACA consortium; and, there is no relationship based on the size of the institution measured in FTE enrollment that faculty administrators are involved in planning for technology in institutions that are members of the ACA consortium. I used the statistical results from survey questions 18, 20, and 21 to test the hypotheses for Research Question 2.

The three survey questions indicated that faculty administrators were involved in planning for technology in institutions that are members of the ACA consortium. The results for survey question 18 showed no significant difference at the $p > .05$ level and the consensus within the group was department chairs, coordinators, deans, or directors were involved in budget planning to a moderate extent, which was surprising compared to the results for survey questions 20 and 21 where respondents indicated only occasional involvement in planning for technology. Academic administrators responded 43%, administrative administrators responded 48%, IT administrators responded 35%/ and department chairs, coordinators, deans, or directors responded 42% that department chairs, coordinators, deans, or directors were involved in budget planning to a moderate extent. It was apparent that the groups IT administrators and department chairs, coordinators, deans, or directors had some reservation. Survey question 20 indicated there was a significant difference between the groups on how often first-level administrators were relied on for guidance in helping to determine how technology was used as a strategy to accomplish planning goals. The crosstab analysis showed a slight difference between the four

groups of administrators, 60% of the academic administrators responded first-level administrators were relied upon frequently or very frequently, 63% of administrative administrators agreed, while only 35% and 40% of IT administrators and department chairs coordinators, deans, or directors agreed. The statistical results for survey question 21 showed no significant difference among the groups regarding how often department chairs, coordinators, deans, or directors were relied upon for guidance in helping determine how technology could be used as a strategy to accomplish planning goals. The crosstab statistics showed a 40% response from academic administrators of occasionally department chairs, coordinators, deans, or directors were relied upon for guidance in helping determine how technology could be used as a strategy to accomplish planning goals. Both groups administrative administrators and department chairs, coordinators, deans, or directors agreed with a 48% response of occasionally department chairs, coordinators, deans, or directors were relied upon for guidance in helping determine how technology could be used as a strategy to accomplish planning goals. IT administrators reported 47% that frequently department chairs, coordinators, deans, or directors were relied upon for guidance in helping determine how technology could be used as a strategy to accomplish planning goals.

In relation to significance between the four groups of institutions based on size of the institution measured in FTE enrollment, all three survey questions showed no significance at $p > 0.5$. Crosstab statistics suggested that the four groups were equal in reporting first-level administrators and department chairs, coordinators, deans, or directors were only occasionally relied upon for guidance in helping determine how technology could be used as a strategy to accomplish planning goals. Thirty-four percent of employees in institutions with less than 1,000 FTE responded occasionally first-level administrators were relied upon and 45% responded

occasionally department chairs, coordinators, deans, or directors were relied upon. The data were very similar for employees in institutions between 1,000 and 1,500 FTE with 34% responding occasionally first-level administrators were relied on and 44% responding occasionally department chairs, coordinators, deans, or directors were relied on. In institutions between 1,501 and 2,000, 40% reported first-level administrators were relied on occasionally and 50% reported department chairs, coordinators, deans, or directors were relied on occasionally. Employees of institutions greater than 2,000 reported 35% first-level administrators were relied on occasionally and 44% reported department chairs, coordinators, deans, or directors were occasionally relied on for guidance in helping determine how technology could be used as a strategy to accomplish planning goals. Collectively, the statistical results for survey questions 18, 20, and 21 concluded there was not a significant difference at the $p > .05$ range. The null hypotheses for Research Question 2 was retained. There was no difference between and among the positions of administrators that faculty administrators were involved in planning for technology in institutions that are members of the ACA consortium; and, there was no relationship based on the size of the institution measured in FTE enrollment that faculty administrators were involved in planning for technology in institutions that are members of the ACA consortium.

Findings Related to Research Question 3

Research Question 3, to what extent are staff administrators involved in planning for technology in institutions that are members of the ACA consortium was tested using the following null hypotheses, there is no difference between and among the positions of administrators that staff administrators are involved in planning for technology in institutions

that are members of the ACA consortium; and, there is no relationship based on the size of the institution measured in FTE enrollment that staff administrators are involved in planning for technology in institutions that are members of the ACA consortium. I used the statistical results from survey questions 18, 20, and 21 to test the hypotheses for Research Question 3.

The results and findings for Research Question 3 are identical to the results and findings for Research Question 2. It became apparent during the data analyses that either I did not need Research Question 3 or that I should have developed the survey questions differently if my goal was to achieve a more granular view of how second-level administrators, specifically staff administrators were involved in planning for technology. For detailed results, see Findings Related to Research Question 2.

Findings Related to Research Question 4

Research Question 4, to what extent are information technology leaders involved in strategic planning in institutions that are members of the ACA consortium was tested using the following null hypotheses, there is no difference between and among the positions of administrators that information technology leaders are involved in the strategic planning process in institutions that are members of the ACA consortium; and, there is no relationship based on the size of the institution measured in FTE enrollment that information technology leaders are involved in the strategic planning process in institutions that are members of the ACA consortium. I used the statistical results from survey questions 19 and 20 to test the hypotheses for Research Question 4.

The statistical results for survey question 19 resulted in no significant differences between the groups at the $p > .05$ level in regard to how often the first-level technology

administrator was relied upon for guidance in helping to determine how technology was used as a strategy to accomplish planning goals. Even though the ANOVA statistics reported no significant differences, the crosstab statistics indicated a noticeable variance between the groups. Academic administrators responded 33% that frequently IT administrators were relied upon, administrative administrators responded 39% that occasionally IT administrators were relied upon, IT administrators responded 35% occasionally they were relied upon, and department chairs, coordinators, deans, or directors responded 32% occasionally IT administrators were relied upon. The statistical results for survey question 20 were addressed previously in this chapter; please see Findings Related to Research Question 2.

According to the statistical results for questions 19 and 20 as associated to the size of the institution measured in FTE enrollment, there was no significant differences between the groups for either question. Crosstab statistics for survey question 20, how often are first-level technology administrators relied upon for guidance in helping to determine how technology was used as a strategy to accomplish planning goals, indicates the respondents almost agree equally between the groups with almost equal representation between the answers occasionally, frequently, and very frequently, see Table 43. Again the statistical results for survey question 20 have already been addressed; please see Findings Related to Research Question 2 for details.

Collectively, the statistical results that were analyzed for survey questions 19 and 20 indicated no significant differences between the groups and the null hypotheses were retained, there was no difference between and among the positions of administrators that information technology leaders were involved in the strategic planning process in institutions that are members of the ACA consortium; and, there was no relationship based on the size of the

institution measured in FTE enrollment that information technology leaders were involved in the strategic planning process in institutions that are members of the ACA consortium.

Findings Related to Research Question 5

The final research question, to what extent do institutional budget considerations align with strategic planning for technology in institutions that are members of the ACA consortium was tested using the following null hypotheses, there is no difference between and among the positions of administrators that institutional budgets are appropriately aligned with the process of strategically planning for technology during the strategic planning process in institutions that are members of the ACA consortium; and, there is no relationship based on the size of the institution measured in FTE enrollment that institutional budgets are appropriately aligned with the process of strategically planning for technology during the strategic planning process in institutions that are members of the ACA consortium. I used the statistical results from survey questions 13, 17, and 18 to test the hypotheses for Research Question 5.

The statistical tests for survey questions 13, 17, and 18 indicated there were no differences between the four groups of position within the institution at the $p > .05$ level. According to the crosstab tests for question 13 both the strategic plan and the technology plan were used for reference during the budget planning. There was a 50% response from academic administrators that both plans were used, 52% of the administrative administrators indicated that both plans were used, and 46% of chairs, coordinators, deans, or directors responded that both plans were used. The IT administrators had a much lower response with only 24% responding that both plans were used. The crosstab tests for question 17 indicated that three of the four groups responded that the strategic plan and the technology plan were appropriately funded by

the institutional budget to a moderate extent. Academic administrators responded 40% that the two plans were appropriately funded to a moderate extend, administrative administrators responded 54%, IT administrators responded 41%; however, department chairs, coordinators, deans, or directors responded 37% that the two plans were appropriately funded to a slight extent. The crosstab results for question 18 were surprising, as all four groups responded department chairs, coordinators, deans, or directors were involved in budget planning to a moderate extent. Academic administrators responded 43% department chairs, coordinators, deans, or directors were involved in budget planning to a moderate extent, and they responded 30% involvement to a great extent. Administrative administrators responded 48% department chairs, coordinators, deans, or directors were involved to a moderate extent; they also responded 39% involvement to a great extent. IT administrators responded 35% department chairs, coordinators, deans, or directors were involved to a moderate extent; and they responded 24% involvement to a great extent; however, they also responded 29% involvement to a slight extent. Department chairs, coordinators, deans, or directors responded 42% they were involved in budget planning to a moderate extent, but they also responded 30% involvement to a great extent.

The statistical results for these three survey questions in relation to size of the institution were somewhat different. The results from survey question 13 showed no significant differences between the groups; but, the crosstab results indicated a slight variance. Institutions with less than 1,000 FTE responded 63% both planning documents were used for reference during budget planning. Each of the other groups responded less than 50% to both planning documents used for reference during budget planning. Instead 46% of the respondents from institutions with FTE 1,000 to 1,500 reported the strategic plan was used, 50% of the respondents from institutions

with FTE 1,501 to 2,000 responded the strategic plan was used, and 45% of the respondents from institutions with FTE greater than 2,000 reported the strategic plan was used. The results from survey question 17 indicated a significant difference between the groups that proved to be true with further testing for three of the four groups. Only the group institutions with FTE less 1,000 showed no significance after additional testing. The crosstab tests for survey question 17 were scattered. Institutions with FTE less than 1,000 responded 42% both plans were appropriately funded by the budget to a moderate extent. Institutions with FTE between 1,000 and 1,500 responded 36% equally both plans were appropriately funded by the budget to a moderate extent but also to a slight extent. Institutions with FTE between 1,501 and 2,000 responded with a resounding 90% both plans were appropriately funded by the budget to a great extent. Institutions with FTE greater than 2,000 responded 38% both plans were appropriately funded to a slight extent but also responded 36% they were funded to a moderate extent.

Although the statistical tests indicated no significant difference for survey question 18 based on size of the institution measured in FTE enrollment, the crosstab tests did indicate there was variance as institutions with FTE between 1,501 and 2,000 responded 70% department chairs, coordinators, deans, or directors were involved in budget planning to a great extent. Institutions with FTE greater than 2,000 responded 38% department chairs, coordinators, deans, or directors were involved in budget planning to a great extent and 36% department chairs, coordinators, deans, or directors were involved in budget planning to a moderate extent. Institutions with FTE less 1,000 responded 49% department chairs, coordinators, deans, or directors were involved in budget planning to a moderate extent. Institutions with FTE between 1,000 and 1,500 responded 44% department chairs, coordinators, deans, or directors were involved in budget planning to a moderate extent. Using the collective analyses of the data the

null hypothesis there is no difference between and among the positions of administrators that institutional budgets are appropriately aligned with the process of strategically planning for technology during the strategic planning process in institutions that are members of the ACA consortium was retained, but the null hypothesis there is no relationship based on the size of the institution measured in FTE enrollment that institutional budgets are appropriately aligned with the process of strategically planning for technology during the strategic planning process in institutions that are members of the ACA consortium was rejected. There was enough evidence to support that institutional budgets are not appropriately aligned with the process of strategically planning for technology during the strategic planning process was affected by the size of the institution.

Conclusions

Based on the findings related to the five research questions from this study, my conclusions are as follows:

1. The research from this study provided evidence that documented strategic planning guidelines were present at the institutions that are members of the ACA consortium and there were no differences between positions or between the sizes of the institution.

2. The research from this study provided evidence that documented technology planning guidelines were present at the institutions that are members of the ACA consortium; however, there was a slight difference among the positions and a noticeable difference between the sizes of institutions.

3. The research from this study provided evidence that the strategic mission, vision, and goals were easily identified at the institutions that are members of the ACA consortium and there were no differences between positions or between the sizes of the institution.

4. The research from this study provided evidence that the technology initiatives were not easily identified and recognized at the institutions that are members of the ACA consortium; however, there were no differences between positions or between the sizes of the institution.

5. The research from this study provided evidence that faculty and staff administrators were only occasionally involved in planning for technology at the institutions that are members of the ACA consortium; however, there were noticeable differences between the positions but no differences between the sizes of institutions.

6. The research from this study provided evidence that faculty and staff administrators are frequently involved in the strategic planning process at the institutions that are members of the ACA consortium and there were no differences between positions or between the sizes of the institution.

7. The research from this study provided evidence that first-level administrators are frequently relied upon for guidance in helping to determine how technology was used as a strategy to accomplish planning goals at the institutions that are members of the ACA consortium and there were no differences between positions or between the sizes of the institution.

8. The research from this study provided evidence that first-level IT administrators are only occasionally relied upon for guidance in helping to determine how technology was used as a strategy to accomplish planning goals at the institutions that are members of the ACA

consortium and there were slight differences between the positions but no significant differences between the sizes of the institution.

9. The research from this study provided evidence that the strategic plan and the technology plan were appropriately funded to a moderate extent by the institutional budget at the institutions that are members of the ACA consortium and there were no significant differences between positions; however, there were significant differences between the sizes of the institution.

10. The research from this study provided evidence that department chairs, coordinators, deans, or directors were involved in the budget planning to either a great or moderate extent at the institutions that are members of the ACA consortium and there significant differences between positions and between the sizes of the institution.

Recommendations

Recommendations for Further Study

1. Replicate the study in the future with additional years of data collected.
2. Replicate the study with future multiple venues to determine how representatives from other institutions, large and small, view whether the technology initiatives are appropriately aligned to institutional strategic plans and whether these planning documents are used effectively to communicate technology needs.
3. A qualitative study should be conducted on this topic to examine the broader themes of technology planning, strategic planning, and institutional planning in higher education

4. A study should be conducted to determine the level to which technology is considered a strategic initiative generally in higher education.

5. A study should be conducted to determine the cost associated with technology and the return on investment (ROI) of technology as a strategy in higher education.

Recommendations for Improvement

1. Higher education institutions should investigate and develop methods to measure return on investment (ROI) to effectively assess technology initiatives.
2. Small, private, liberal arts colleges should develop collaborative methods to share effective process and procedures for effective strategic and technology planning and how they are aligned.

REFERENCES

Agee, A.S., & Zenelis, J. G. (2002). Technology across the curriculum: Information literacy and IT fluency. In B. L. Hawkins, J. A. Rudy, & W. H. Wallace, Jr. (Eds.), Technology everywhere a campus agenda for educating and managing workers in the digital age. New York: Jossey-Bass (pp. 259-281)

Allison, D. H., & DeBlois, P. B. (2008). *Top* 10 IT issues 2008. *EDUCAUSE Review*, 43(3), 37-61.

Allison, M., & Kaye, J. (2005). *Strategic planning for nonprofit organization: A practical guide and workbook*. San Francisco: John Wiley & Sons.

Almanac (2008, August). *Chronicle of Higher Education*, Almanac 2008-2009, 150(1), 6-8.

Appalachian College Association. (2005). *Overview*. Retrieved October 12, 2006 from http://www.aca.org.

Bassett, E. (2005). View from the top. Retrieved January 10, 2007 from http://www.edtechmag.com/higher/winter-2005/special-report.html

Bates, A. W. (2000). *Managing technological change: Strategies for college and university leaders*. San Francisco: Jossey-Bass.

Bates, A.W., & Poole, G. (2003). *Effective teaching with technology in higher education foundations for success*. San Francisco: Jossey-Bass.

Beeby, D., Donenfeld, S., Jelinkova, K., Knox, J. Palenchar, E. & Rini, J. (2006). Increasing IT value for customers: a challenge for higher education. *EDUCAUSE Center for Applied Research (ECAR)*, Research Bulletin, 5, 1-12.

Benkler, Y. (2008). The university in the networked economy & society challenges and opportunities. *EDUCAUSE Review*, 43(6), 59-72.

Blonin, V.A. (2004). Strategic planning at university: the American experience and problems of its adaptation at regional Russian university, a case study. Retrieved December 12, 2008 from http://www.fup.unn.ru/acenter/upload/docs/Case-study_Blonin.pdf

Boar, B. H. (2001). *The art of strategic planning for information technology*. New York: John Wiley & Sons.

Boettcher, J.V., Doyle, M. M., & Jenson, R. W. (2000). *Technology driven planning: Principles to practice*. Ann Arbor, MI: Society for College & University Planning.

Boutelle, J. (2004). Understanding organizational stakeholders for design success. *Boxes and Arrows*. Retrieved November 30, 2008 from http://www.boxesandarrows.com/view/understanding_organizational_stakeholders_for_design_success

Cavalier, J. C. (2002). The forgotten question in information technology strategic planning. *Planning in Higher Education*, 31(1), 4-14.

Cowburn, S. (2005). Strategic planning in higher education: Fact or fiction? *Perspectives: Policy & Practice in Higher Education*, 9(4), 103-109. Retrieved December 6, 2007 from EBSCOhost.

Day, J. C., Janus, A., & Davis, J. (2005). *Computer and internet use in the United States: 2003 Special Studies*, U.S. Census Bureau, Washington, DC: U.S. Government Printing Office. Retrieved December 15, 2008, from http://www.census.gov/prod/2005pubs/p23-208.pdf

Dooris, M. J., Kelley, J. M., & Trainer, J. F. (2002). Successful strategic planning. *New Directions for Higher Education*, 116, 5-11. Retrieved November 20, 2007 from EBSCOhost.

Dowie, S. (2002). Grappling with strategic dissonance. *Planning in Higher Education*, 31(1), 30-38. Retrieved March 24, 2006, from the H. W. Wilson Company Wilson Web.

Duderstadt, J. J. (1999). Can colleges and universities survive in the information age? In R. N. Katz & Associates (Eds.), Dancing with the devil: Information technology and the new competition in higher education. San Francisco: Jossey-Bass. (pp. 1-25).

Duderstadt, J. J., Atkins, D. E., & Van Houweling, D. V. (2002). *Higher education in the digital age*. West Port, NY: Praeger.

Edge, J. W. (2004). The need for strategic planning in academia. *THE Journal*, 32(3), 40-42. Retrieved March 24, 2006, from the H. W. Wilson Company Wilson Web.

Floyd, E. S. (2008). A changing profile. *EDUCAUSE Review*, 43(3), 8-9.

Foster, L. (2004). Meeting the next phase of challenges [Electronic Version]. New Directions for Community College, 128, 73-78.

Foster, S. J., & Hollowell, D. E. (1999). Integrating information technology planning and funding at the institutional level. In R. N. Katz & J. A. Rudy (Eds). Information technology in higher education: Assessing its impact and planning for the future. San Francisco: Jossey-Bass (pp. 9-19).

Fox, A. (2002). *A study of the extent to which institutional strategic planning serves as a guide for technology planning in Tennessee board of regents institutions*. Unpublished doctoral dissertation, East Tennessee State University.

Goldstein, P.J., & Caruso, J. B. (2004, November). Information technology funding in higher education. EduCause Center for Applied Research (ECAR), (pp. 1-7). Retrieved September 10, 2007, from http://net.educause.edu/ir/library/pdf/ecar_so/ers/ERS0407/ekf0407.pdf

Gould, R., Unger, E., & Bacon, A. (2008). Growing the next generation of leaders. *EQ EDUCAUSE QUARTERLY*, 31(3), 58-61.

Gilbert, S. W. (1995). Teaching, learning, & technology—the need for campuswide planning and faculty support services. *Change*, 27, 46-48. Retrieved March 20, 2006 from the H. W. Wilson Company Wilson Web.

Green, K. C., (2006). Bring data: A new role for information technology after the Spellings commission. *EDUCAUSE Review*, 41(6), 31-46.

Greer, W. T. (n. d.). Aligning technology with strategic objectives in higher education.

Greer, W. T. (2006). Crafting the perfect game plan. EdTech, Oct/Nov. 2006, Retrieved March 30, 2008, from the H.W. Wilson Company Wilson Web.

Grush, M. (2004). A new realm of IT planning, *Campus Technology*, November 1, 2004.

Hanna, D. E. & Associates. (2,000). *Higher education in an era of digital competition*. Madison, WI: Atwood.

Hartman, J. L. (2008). Moving teaching and learning with technology from adoption to transformation. *EDUCAUSE Review*, 43(6), 24-25.

Hartman, J.L., Dziuban, C., & Brophy-Ellison, J. (2007). Faculty 2.0. *EDUCAUSE Review*, 42(5), 62-76.

Hawkins, B. L., & Marcum, D. B. (2002). Leadership challenges for the campus and the profession. In B. L. Hawkins, J. A. Rudy, W. H. Wallace, Jr. (Eds). Technology everywhere: A campus agenda for educating and managing workers in the digital age. San Francisco: Jossey-Bass (pp. 127-137).

Higdon, L. I. (2006). Beyond the rhetoric: a midterm appraisal, *EDUCAUSE Review*, 41(2), 8-9.

Hilton, J. (2006) The future for higher education sunrise or perfect storm, *EDUCAUSE Review*, (41)2, 59-71.

Holland, L., & Steward, T. (2,000). A different divide: preparing tech-savvy leaders. *Leadership*, 30(1), 8-10. Retrieved March 25, 2006 from the H. W. Wilson Company Wilson Web.

Huff, W. D. (2,000). Colleges and universities: survival in the information age. *Computers & Geosciences*, 26, 635-640. Retrieved March 26, 2006 from the H. W. Wilson Company Wilson Web.

Hunt, C. M., Stevens, R. E., Loudon, R.L., Oosting, O. W., & Migliore, R. H. (1997). *Strategic planning for private higher education*. Philadelphia: Haworth Press.

Jeffery, M., & Goldstein, P. J. (2005). IT portfolio management for colleges and universities: Balancing risk/return for strategic results. *EDUCAUSE Center for Applied Research*, 2005(3), 1-11.

Johnson, L,. Lamb, A., & Teclehaimanot, B. (2003). Academic technology: the convergence of diverse disciplines. *College University Media Review*, 9(2), 91-106. Retrieved March 25, 2006 from the H. W. Wilson Company Wilson Web.

Johnson, R. A., Mitrano, T., & Vernon, R. D. (2003). Meeting the cybersecurity challenge. In P. E. McClure (Ed.), Organizing and managing information resources on your campus. San Francisco: Jossey-Bass (pp. 93-127).

Katz, R. N. & Associates. (1999). Dancing with the devil: Information technology and the new competition in higher education. San Francisco: Jossey-Bass.

Katsioloudes, M. (2002). *Global strategic planning cultural perspectives for profit and nonprofit organizations*. Burlington, MA: Butterworth-Heinemann.

Kaufman, R., & Lick, D. W. (2,000). Mega-level strategic planning: Beyond conventional wisdom. In J. V. Boettcher, M. M. Doyle, R. W. Jenson (Eds.), Technology driven planning: Principles to practice. Ann Arbor, MI: SCUP.

Kouzes, J., & Posner, B. (2002). *The leadership challenge*. (Rev. ed). San Francisco: Jossey-Bass.

Kohrman, II, C. P. (2008). No free lunch: A condensed strategic planning process. *EQ EDUCAUSE QUARTERLY*, 31(4), 62-65.

Leach, W. D. (2008). Shared governance in higher education: Structural and cultural responses to a changing national climate. Center for Collaborative Policy Publications, Retrieved from http://www.csus.edu/ccp/publications.stm

Levine, A. E. (2001). Sure changes for colleges in the future. *The Education Digest*, 66(5), 54-58. Retrieved November 26, 2007 from EBSCOhost.

McDowell, R. L., & Simon, W.L. (2001). *Driving digital*. New York: Harpert Business an Import of Harper Collins.

McClure, A. (2007). Technology spending survey ’08: Inside the minds and budges of chief information officers and IT directors. *University Business*, December 2007, 15-18.

McClure, P. A. (2003). Managing the complexity of campus information resources. In P. E. McClure (Ed.), Organizing and managing information resources on your campus. San Francisco: Jossey-Bass (pp. 1-13).

McCord, J. (2003). Sourcing information technology services. In P. E. McClure (Ed.), Organizing and managing information resources on your campus. San Francisco: Jossey-Bass (pp. 59-75).

McCredie, J. (2,000). Planning for IT in higher education. EDUCAUSE QUARTERLY, 23(4), 14-21.

McGee, P., & Diaz, V. (2007). Wikis and podcasts and blogs! Oh, my! What is a faculty member supposed to do? *EDUCAUSE Review*, 42(5), 28-40.

McNeely, B. (2005). Using technology as a learning tool, not just the cool thing to do. In D. G. Oblinger & J. L. Oblinger (Eds.), Educating the net generation. EDUCAUSE (pp. 4.1-4.10).

Milam, J. (2,000). *Cost analysis of online courses*. AIR Forum Paper, Education Leadership, Policy, & Foundations, Curry School of Education, University of Virginia. Retrieved January 15, 2008 from http://highered.org/docs/milam-onlinecoursecosts.PDF

Mott, J. D., & Granata, G. (2006). The value of teaching and learning technology: Beyond ROI. *EDUCAUSE QURARTELY, 29(2),* 48-54

Neal, J. G., & McClure, P. A. (2003). Organizing information resources for effective management. In P. E. McClure (Ed.), Organizing and managing information resources on your campus. San Francisco: Jossey-Bass (pp. 29-44).

Oblinger, D. G. (2008). EDUCAUSE focusing on the common good for higher education. *EDUCAUSE Review*, 43(6), 21-22.

Oblinger, D. G. (2009). Making uncommon common. *EDUCAUSE Review*, 44(1), 72.

Oblinger, D. G., & Hawkins, B. L. (2006). The myth about no significant difference. *EDUCAUSE Review*, 41(6), 14-15.

Olcott, D., & Schmidt, K. (2,000). Redefining faculty policies and practices for the knowledge age. In D. E. Hanna & Associates (Eds.), Higher education in an era of digital competition: Choices and challenges. Madison, WI: Atwood (pp. 259-281).

Olsen, F. (2003). Colleges expect to increase information-technology spending by 5 percent. *The Chronicle of Higher Education: Daily News*. Retrieved January 15, 2008 from http://chronicle.com/article/Colleges-Expect-to-Increase/6588

Owen, P. S., & Demb, A. (2004). Change dynamics and leadership in technology implementation. *The Journal of Higher Education*, 75(6), 636-666. Retrieved November 20, 2006 from EBSCOhost.

Podolsky, J. (2003). *Wired for good*. San Francisco: Jossey-Bass a Wiley Imprint.

Penrod, J. (2003). Creating a realistic IT vision: the roles and responsibilities of a chief information officer. *Technology Source*. Retrieved March 30, 2008 from http://technologysource.org/article/creating_a_realistic_it_vision:_the_roles_and_responsibilities_of_a_chief_information_officer/

Penrod, J. (2003). Building an effective governance and decision-making structure for information technology. In P. E. McClure (Ed.), Organizing and managing information resources on your campus. San Francisco: Jossey-Bass (pp. 15-28).

Pirani, J. A., & Salaway, G. (2004). Information technology alignment in higher education. *EDUCAUSE Center for Applied Research*, 1-10.

Pitocchelli, J., Chakrin, B., & Murphy, T. (2,000). How faculty use information technology at a small liberal arts college: A case study. SIGUCCS 2,000, Building the future, proceedings of the 28th SIGUCCS Conference Services, Richmond.

Reich, B. H., & Benbasat, I. (2,000). Factors that influence the social dimension of alignment between business and information technology objectives. *MIS Quarterly*, 24(1), 81-113. Retrieved March 26, 2007 from JSTOR.

Rice, M. L., & Miller, M. T. (2001). Faculty involvement in planning for the use and integration of instructional and administrative technologies. *Journal of Research on Computing in Education*, 33(3), 328-336. Retrieved May 1, 2008 from ProQuest Education Journals.

Roberts, G. R. (2005). Technology and learning expectations of the net generation. In D. G. Oblinger & J. L. Oblinger (Eds.), Educating the net generation. EDUCAUSE (pp. 3.1-3.7).

Rowley, D. J., & Sherman, H. (2001). *Issues of strategic implementation in higher education: The special concerns for institutions in developing economies*. Retrieved, July 15, 2008, from http://www.sba.muohio.edu/abas/2001/brussels/Rowley_Brussels-Rowley_Sherman.pdf

Rowley, D. J., Lujan, H. D., & Dolence, M.G. (1997). *Strategic change in colleges and universities*. San Francisco: Jossey-Bass.

Russo, A., Milliner-Fairbanks, A., & Paynich, M. (2006). *Traditional college students not so traditional*. Retrieved, January 15, 2008, from http://thisweekineducation.blogspot.com/2006/02/traditional-college-students-not-so.html

Savarese. J. (2004). IT planning designing IT mission [Electronic Version]. *Campus Technology*.

Scalia, C. (2002, December 2). Trends and catalysts in higher education today. [Electronic Version]. *College Planning and Management*.

Schachter, D. (2005). How to create a realistic budget [Electronic Version]. *Information Outlook*. Washington, 9(9), 10-11.

Schaffhauser, D. (2009). *Trends for higher education in 2009: Network management*. Retrieved March 10, 2009, from http://www.edchannelpartner.com/articles/70884/

Schwartz, C. M., Craig, E. M., Trzeciak, J., Little, J. K., & Diaz, V. (2008). Student input in college decision making. *EDUCAUSE QUARTERLY*, 31(3), 73-75.

Sevier, R. A., (2001). *Thinking outside the box*. Hiawatha, IA: Strategy.

Sevier, R. A., (2003). Marketing from strategy to action. [Electronic Version]. *University Business,* 18-19.

Shapiro, S. (2007). Rethinking the traditional college student stereotype: A snapshot of the adult learner. Retrieved January 10, 2009 from http://www.prwebdirect.com/releases/2007/3/prweb512311.php

Smallen, D. L., & McCredie, J. (2003). Getting beyond budget dust to sustainable models for funding information technology. In P. E. McClure (Ed.), Organizing and managing information resources on your campus. San Francisco: Jossey-Bass (pp. 45-58).

Strategic planning in higher education: A guide for leaders. (n.d.). Retrieved December 10, 2007 from http://www.cdl.rutgers.edu/literature/pdf/guideforleaders.pdf

Stewart, H. (2002). Technology assessment: Making sure we get it right. [Electronic Version]. *EDUCAUSE Center for Applied Research*, Research Bulletin, 2001(21), 2.

Strong, B. (2007). Strategic planning for technological change. *EQ EDUCAUSE Quarterly*, 30(3), p. 49-51.

TechSoup, the technology place for nonprofits, (2008). *Technology Planning*. Retrieved November 10, 2008 from http://www.techsoup.org/learningcenter/techplan/index.cfm

Tromp, S. A., & Rueben, B. D., (2004). *Strategic planning in higher education: A guide for leaders*. Washington, DC: NACUBO.

Trinkle, D. A. (2005). The 361^{o} model for transforming teaching and learning with technology. *EQ EDUCAUSE QUARTERLY*, 28(4), p. 18-24.

Turner, L.A., & Perry, S. (2002). Campus human resource leadership: A mandate for change. In B. L. Hawkins, J. A. Rudy, & W. H. Wallace, Jr. (Eds.), technology everywhere a campus agenda for educating and managing workers in the digital age. New York: Jossey-Bass (pp. 53-73)

University of Iowa Website. (2008, May 15). Strategic plans. Retrieved from http://www.uiowa.edu/homepage/news/strategic-plans/

Vonderwell, S., Zachariah, S. & Franklin, T. (2008). Web 2.0 and Implications on Authorship, Culture, Community and Education. In Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2008 (pp. 6085-6086). Chesapeake, VA: AACE.

Welsh, J. F., & Nunez, W. J. (2005). Faculty and administrative support for strategic planning: A comparison of two- and four-year institutions. *Community College Review*, 32(4), p. 20-39.

Wilen-Daugenti, T., & McKee, A.G. (2008, August). *21st century trends for higher education top trends, 2008–2009*. Retrieved December 15, 2008, from http://www.cisco.com/web/about/ac79/docs/wp/21st_Century_Top_Trends_POV_0811.pdf

APPENDICES

APPENDIX A

Initial Email Letter to Invited Participants

Dear Invited Participant;

I am a doctoral candidate in Educational Leadership at East Tennessee State University. Dr. Terry Tollefson in the College of Education, Department of Educational Leadership, serves as my adviser. Dr. Jasmine Renner is my committee Chair. My area of research interest is determining how small, private institutions plan for technology. I have targeted institutions that are members of the Appalachian College Association (ACA) as my population. The survey instrument I have developed to solicit this information asks for information regarding your experiences in strategic planning and planning for technology at your institution. The peer-reviewed analysis of the survey instrument revealed that it should take less than 15 minutes of your time to complete.

The results of the survey will be summarized across all institutions and used in my dissertation. Individual answers will be kept strictly confidential and will not be reported as individual responses in my dissertation. I ask for identification only as a means of sending out follow-up requests for information. Please let me assure you that I will not divulge any information regarding any specific participant or any specific institution.

I am currently the Director of Academic Computer Support at Lincoln Memorial University (LMU) and our institution is an active member of the ACA. I have been involved in both strategic planning and technology planning at LMU for the past 12 years and I have collaborated with many of you in the past.

If you would like an executive summary of the results from this summary, please feel free to contact me via Email at sheree.schneider@lmunet.edu. I would like to thank you in advance for taking the time to complete the survey and for helping me to complete my doctoral work.

Sheree A. Schneider
Lincoln Memorial University
Doctoral Candidate East Tennessee State University

Please click the link below to begin the survey.

APPENDIX B

Reminder Email Letter to Invited Participants

Dear Invited Participant;

I am a doctoral candidate in Educational Leadership at East Tennessee State University. I recently sent you a survey invitation to participate in my research. My area of research interest is determining how small, private institutions of higher education plan for technology and you were included because I feel your input is relevant when planning for technology at your institution. The survey instrument I have developed to solicit this information asks for information regarding your experiences in strategic planning and planning for technology at your institution. I am trying to determine the level of involvement from various campus stakeholders. The online survey instrument is only 2 pages and should take less than 15 minutes of your time to complete. The first page is primarily yes or no responses and the second is Likert-scale weighted.

The results of the survey will be summarized across all institutions and used in my dissertation. Individual answers will be kept strictly confidential and will not be reported as individual responses in my dissertation. Please let me assure you that I will not divulge any information regarding any specific participant or any specific institution.

If you would like an executive summary of the results from this summary, please feel free to contact me via Email at sheree.schneider@lmunet.edu. I would like to thank you in advance for taking the time to complete the survey and for helping me to complete my doctoral work. I know how busy things are at our institutions.

Sheree A. Schneider
Lincoln Memorial University
Doctoral Candidate East Tennessee State University

Please click the link below to begin the survey

APPENDIX C

Reminder Email Letter to Invited Participants

Dear Invited Participant;

I apologize for asking once again!! I am about 20 surveys short of reaching my goal of 50% response. I am a doctoral candidate in Educational Leadership at East Tennessee State University. I recently sent you a survey invitation to participate in my research. If there is any way at all you could take the time to answer my 25-question survey, I would be extremely grateful. You have been selected to represent your institution because I am convinced your position should be involved in both strategic and technology planning

My area of research interest is determining how small, private institutions of higher education plan for technology and you were included because I feel your input is relevant when planning for technology at your institution. The survey instrument I have developed to solicit this information asks for information regarding your experiences in strategic planning and planning for technology at your institution. I am trying to determine the level of involvement from various campus stakeholders. The online survey instrument is only 2 pages and should take less than 15 minutes of your time to complete. The first page is primarily yes or no responses and the second is Likert-scale weighted.

The results of the survey will be summarized across all institutions and used in my dissertation. Individual answers will be kept strictly confidential and will not be reported as individual responses in my dissertation. Please let me assure you that I will not divulge any information regarding any specific participant or any specific institution.

If you would like an executive summary of the results from this summary, please feel free to contact me via Email at sheree.schneider@lmunet.edu. I would like to thank you in advance for taking the time to complete the survey and for helping me to complete my doctoral work. I know how busy things are at our institutions.

Sheree A. Schneider
Lincoln Memorial University
Doctoral Candidate East Tennessee State University

Please click the link below to begin the survey
.

APPENDIX D

Participant Survey

Dissertation Research

Dissertation Research - Sheree Schneider
Technology Planning Assessment

Page 1 - Question 1 - Choice - Multiple Answers (Bullets)

Please indicate your position within your institution. Please choose only one.

- ❑ Academic officer (VP) or first-level academic manager
- ❑ Administrative officer (VP) or first-level administrative manager
- ❑ Chief information officer or first-level IT manager
- ❑ Dean/Director/Coordinator or second-level Manager (reports to first-level manager)

Page 1 - Question 2 - Choice - Multiple Answers (Bullets)

Please indicate the size of your institution in FTE. Please choose only one.

- ❑ <1,000 FTE
- ❑ 1,000-1,500 FTE
- ❑ 1,501-2,000 FTE
- ❑ >2,000 FTE

Page 1 - Question 3 - Yes or No

Are there documented strategic planning guidelines at your institution?

- ○ Yes
- ○ No

Page 1 - Question 4 - Yes or No

Are the strategic mission, vision, and goals of your institution easily identified and recognized?

- ○ Yes
- ○ No

Page 1 - Question 5 - Yes or No

Are department chair(s)/coordinator(s)/dean(s)/director(s) of your institution represented on the strategic planning committee?

- ○ Yes
- ○ No

Page 1 - Question 6 - Yes or No

Is the office of information technology/chief information officer represented on the strategic planning committee?

- ○ Yes
- ○ No

Page 1 - Question 7 - Yes or No

Is the technology plan available and used for reference by members of the strategic planning committee?

- ○ Yes
- ○ No

Page 1 - Question 8 - Yes or No

Are there documented technology planning guidelines at your institution?

- ○ Yes
- ○ No

Page 1 - Question 9 - Yes or No

Are the technology initiatives of your institution easily identified and recognized?

- ○ Yes
- ○ No

Page 1 - Question 10 - Yes or No

Are department chair(s)/coordinator(s)/dean(s)/director(s) of your institution represented on the technology planning committee?

- ○ Yes
- ○ No

Page 1 - Question 11 - Yes or No

Are top level administrators (vice presidents; academic officers, etc.) represented on the technology planning committee?

- ○ Yes
- ○ No

Page 1 - Question 12 - Yes or No

Is the strategic plan available and used for reference by the members of the technology planning committee?

- ○ Yes
- ○ No

Page 2 - Question 13 - Choice - Multiple Answers (Bullets)

Is the strategic plan, technology plan or both used for reference during budget planning?

- ❑ The strategic plan is used as a reference
- ❑ The technology plan is used as a reference
- ❑ Both the strategic plan and the technology plan are used as a reference
- ❑ Neither are used during budget planning

Page 2 - Question 14 - Choice - Multiple Answers (Bullets)

To what extent are the strategic planning guidelines helpful in achieving the institutional vision?

- ❑ To a great extent.
- ❑ To a moderate extent.
- ❑ To a slight extent.
- ❑ Not at all.
- ❑ No opinion.

Page 2 - Question 15 - Choice - Multiple Answers (Bullets)

To what extent are the technology planning guidelines helpful in achieving the technology initiatives of your institution?

- ❑ To a great extent.
- ❑ To a moderate extent.
- ❑ To a slight extent.
- ❑ Not at all.
- ❑ No opinion.

Page 2 - Question 16 - Choice - Multiple Answers (Bullets)

To what extent is the technology plan aligned with the institutional strategic plan at your institution?

- ❑ To a great extent.
- ❑ To a moderate extent.
- ❑ To a slight extent.
- ❑ Not at all.
- ❑ No opinion.

Page 2 - Question 17 - Choice - Multiple Answers (Bullets)

To what extent are the strategic plan and the technology plan appropriately funded by the institutional budget.

- ❑ To a great extent.
- ❑ To a moderate extent.
- ❑ To a slight extent.
- ❑ Not at all.
- ❑ No opinion.

Page 2 - Question 18 - Choice - Multiple Answers (Bullets)

To what extent are department chair(s)/coordinator(s)/dean(s)/director(s) involved in budget planning?

- ❑ To a great extent.
- ❑ To a moderate extent.
- ❑ To a slight extent.
- ❑ Not at all.
- ❑ No opinion.

Page 2 - Question 19 - Choice - Multiple Answers (Bullets)

How often is the office of information technology/chief information officer relied upon for guidance in helping determine how technology could be used as a strategy to accomplish planning goals?

- ❑ Very frequently.
- ❑ Frequently.
- ❑ Occasionally.
- ❑ Rarely.
- ❑ Never.
- ❑ No opinion.

Page 2 - Question 20 - Choice - Multiple Answers (Bullets)

How often are top-level administrators (vice presidents, academic officers, etc.) relied upon for guidance in helping determine how technology could be used as a strategy to accomplish planning goals?

- ❑ Very frequently.
- ❑ Frequently.
- ❑ Occasionally.
- ❑ Rarely.
- ❑ Never.
- ❑ No opinion.

Page 2 - Question 21 - Choice - Multiple Answers (Bullets)

How often are department chair(s)/coordinator(s)/dean(s)/director(s) relied upon for guidance in helping determine how technology could be used as a strategy to accomplish planning goals?

- ❑ Very frequently.
- ❑ Frequently.
- ❑ Occasionally.
- ❑ Rarely.
- ❑ Never.
- ❑ No opinion.

Page 2 - Question 22 - Choice - Multiple Answers (Bullets)

How often is the strategic planning document used as a vehicle for communicating the technology needs of the institution?

- ❑ Very frequently.
- ❑ Frequently.
- ❑ Occasionally.
- ❑ Rarely.
- ❑ Never.
- ❑ No opinion.

Page 2 - Question 23 - Choice - Multiple Answers (Bullets)

How often is the technology planning document used as a vehicle for communicating the technology needs of the institution?

- ❑ Very frequently.
- ❑ Frequently.
- ❑ Occasionally.
- ❑ Rarely.
- ❑ Never.
- ❑ No opinion.

Page 2 - Question 24 - Choice - Multiple Answers (Bullets)

How often is technology used as a strategy for achieving institutional goals?

- ❑ Very frequently.
- ❑ Frequently.
- ❑ Occasionally.
- ❑ Rarely.
- ❑ Never.
- ❑ No opinion.

Page 2 - Question 25 - Choice - Multiple Answers (Bullets)

In the past year, which of the scenarios below best suits your institution when it comes to technology planning and the budget?

- ❑ We budgeted for and purchased new technology for classroom instruction.
- ❑ We did not budget for but had to purchase technology to upgrade our network infrastructure to support new technology.
- ❑ We budgeted for and purchased technology to upgrade student computer labs and faculty and staff computers.
- ❑ We decided to purchase technology for classroom instruction during the summer months because we had extra money and available time.
- ❑ We were too busy taking care of older, outdated technology equipment to plan for new technology.
- ❑ No opinion.

VITA

SHEREE' A. SCHNEIDER

Personal Data:	Date of Birth: July 26, 1956
	Place of Birth: Jellico, TN
	Marital Status: Married
Education	East Tennessee State University, Johnson City, TN; Ed.D in Educational Leadership; 2010
	Lincoln Memorial University, Harrogate, TN; Ed.S. in Curriculum and Instruction; 2002
	Nova Southeastern University, Ft. Lauderdale, FL; M.S. in Management Information Systems; 2000
	Lincoln Memorial University, Harrogate, TN; B.S. in Biology/Chemistry; 1979
Professional Experience	Lincoln Memorial University, Harrogate, TN; Director of Academic Computer Services; 1996 to Present
	Quanterra Environmental Services, Knoxville, TN; Systems Manager; 1988-1994
	Cyprus Cumberland Coal Corporation, Middlesboro, KY; Environmental Specialists; 1979-1988
Memberships	Kappa Delta Pi Educational Honor Society, Chapter Member Golden Key International Honour Society Leadership Claiborne, Member