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Exploring the influence of academic technology professionals in higher education

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EXPLORING THE INFLUENCE OF ACADEMIC TECHNOLOGY PROFESSIONALS IN HIGHER EDUCATION

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DEDICATION

This dissertation, the culmination of a long journey, is dedicated to my mother, Andrea, who encouraged me to pursue an education and supported me every step of the way with no judgment, only love and acceptance. Without her belief in me I would never have made it. I know that she is looking down on me with a smile and pride.

לאמי, חנה בת ריטה ויוסף, תודות מעומק הלב ובאהבה.
יהי זכרה ברוך

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ABSTRACT

Exploring the Influence of Academic Technology Professionals in Higher Education

Academic Technology (AT) is a fast growing field that deserves attention given its dynamic nature and impact on educational practices. The field has evolved from information technology to concentrate on advancing technology to enhance teaching and learning. Yet, the field appears to be insufficiently mature or defined making it difficult for AT professionals to be categorized and characterized or to fully understand their changing roles. There is uncertainty as to the roles, responsibilities and positions of AT professionals both within and outside of the field.

Research in this area is minimal and highlights the need for strategic action to support the differentiation of instructional tasks and promote the influence of AT professionals (Kowch, 2013; Nworie, 2005). An online survey was conducted of 81 AT professionals to better understand the responsibilities and perceptions of their roles, concerns and influence. Statistical factor analysis identified five most cited responsibilities and compared the differences between what the professionals ñdoò and what they believed they ñshouldò do. ANOVA was used to calculate gaps in performance based on the ñdoò and ñshouldò responses.

The study findings concludes that the majority of AT professionals have influence on the AT decision making process at their institution of higher learning, AT decisions appear to be made based on technological rather than pedagogical considerations and AT professionals have an expanded responsibilities and obligations at their institution of higher learning. These findings are consistent with literature that indicates that AT professionals need to be in influential positions on campus and that decisions concerning technology for teaching and

learning are not made by AT professionals who are unique in that they have knowledge and experience in both academia and technology (Kowch, 2005).

This study suggests more research is needed especially in the areas of AT in higher education and AT leadership. For example do universities have an AT strategic plan? If so, who is charged with implementation? Further research in these areas will enhance the field of AT and solidify the AT leadership position on campus.

Chapter 1: Exploring the Influence of Academic Technology Professionals in Higher Education

For more than 200 years, colleges and universities have embraced digital technology and employed it in support of virtually all aspects of academic and administrative college life (Oblinger, 2010). Nevertheless, Susan Metros, Associate Vice Provost and Deputy Chief Information Officer (CIO) at the University of Southern California, describes a troublesome situation that plays out on college campuses all over the world:

> IT [Information Technology] departments are often guilty of offering services that are technically complex, user unfriendly, poorly communicated, and perceived as changing too rapidly. Many IT systems are based on technical requirements decided by the IT group alone and not on what is best suited for the faculty member undertaking research, advancing scholarship, teaching classes, and/or serving the community. (Metros, 2010, p. 54)

Typically, colleges have one IT department to service a wide range of goals and needs, even though there can be no single technological approach that adequately addresses all of them. If the goal is to support teaching and learning at the college, the focal issue of this paper, IT personnel who understand technological applications to teaching should make a dedicated effort to communicate and work with faculty and students to achieve the collegeôs mission (Nworie & Albright, 2008). This bridge between the IT and teaching worlds is Academic Technology (AT), usually led by the Senior AT Officer (Nworie & Albright, 2008). However, many institutions do not have a dedicated AT officer at any level, let alone in an influential position.

One use of the acronym ñATò is an abbreviation for Assistive Technologies. This study does not refer to assistive technologies, all uses of the AT acronym will refer to academic

technology. For the purpose of this paper, AT is used to describe the design, development, utilization, management, and evaluation of technology processes and resources for teaching and learning in higher education (Lamb, Johnson, & Teclehaimanot, 2003). According to the Association for Educational Communications and Technology, ñeducational technologyò and ñlearning technologyò are often used interchangeably to mean the use of technology to enhance teaching and learning in general (AECT, 2007) , while ñacademicò refers to higher education and does not include the K-12 sector.

Common examples of AT are Learning Management Systems (LMS), used for hybrid and distance learning courses; Student Response Systems (Clickers), used for in-class assessment; and video podcasting, commonly used in flipped classroom scenarios. These technologies are just a few examples of those used in teaching and learning in higher education. The list of technologies that are currently used and will be used in the future is constantly changing and growing. AT professionals are found on campus assisting IT departments and supporting faculty in integrating technology into their teaching repertoire in a pedagogically sound way, yet they are seldom found in influential positions on campus (Kowch, 2005).

Paul Michael Privateer, Professor of Humanities at Arizona State University, states that if colleges are going to be contemporary and effective they must have a strategic AT agenda that focuses on changing the model of traditional higher education, where the emphasis has been on storage and recall of information rather than producing intelligence, enabling students to synthesize information, and linking it to real world situations (Privateer, 1999). He further states that higher education needs to develop a strategically guided approach to technology-mediated instruction. In order for this to happen, learning outcomes need to be consistent and integrated

throughout the curriculum, and there should be dedicated resources on campus that are managed by an AT officer (Privateer, 1999).

In different forms, technology has been a part of education for a long time. Chapter Two presents a short history of the evolution of the field of AT. Michael J. Albright (1989) wrote ñInstructional Technology has never had a brighter future than in 1989,ò yet Susan Metrosô comment reflects the ambiguousness of AT in 2010. In the 11 years between Albright and Metrosôcomments, individuals filled AT roles on campus, but many were without clear charters and official, defined positions within their organizations (Nworie, 2005).

Ana Donaldson, past president of the Association for Educational Communications and Technology, wrote that describing the profession of AT to others can be a daunting task. Part of the challenge that AT professionals face is even what to call themselves, and Donaldson suggests that if position titles were more descriptive and uniform it would be easier to clarify what the professional does (Donaldson, 2012). John Nworie (2005) also states that as the roles and responsibilities of the AT professional changes, so does the job title.

The terminology used to describe the field needs to be clear. Lamb et.al. (2003) broadly define AT professionals as those who encompass the broad functions of creating collections of digital resources for faculty and student use; designing and supporting classroom technologies; and assisting faculty to integrate technology into their teaching. The lack of a clear understanding of the AT field leads to much confusion when discussing the roles and responsibilities of the professionals who identify with the community. Donaldson, who described her predicament as president of a nationally recognized AT professional group above, should not have difficulty explaining to others what she does for a living. According to Bates and Sangra (2011), academic technologists should be responsible for helping the college support innovation

in teaching and establish goals and strategies for learning technologies. These AT professionals should facilitate a collective approach to setting and implementing learning technology goals and be champions for change in the way that instructors teach (Bates & Sangra, 2011). Information Technology (IT) focusses on technology implementation and support across campus, while AT concentrates on those technologies that support teaching and learning and the pedagogy of their implementation into the curriculum.

As Table 1 illustrates, IT professionals tend to focus on technology as a tool, ensure its delivery, and maintain the infrastructure. They work with an end user to ensure that person can make the technology tool function. The AT professional emphasizes technology as an application to achieve pedagogic goals and objectives, focuses on integration of technology and instructional design and the creation of content and methods that are appropriate for technology use in education.

Table 1
A comparison of Information Technology and Academic Technology

Information Technology	**Academic Technology**
Technology as a Tool	Technology as an Application
Focus on Delivery	Focus on Integration
Technology Infrastructure	Instructional Design (Content Production)
End User Support	Faculty Development
Systems and Network Administration	Technical and Pedagogic Training
Accessibility	Skills Development
Stability	Quality Assurance and Assessment

In theory, a collegeôs different operating divisions are united in fulfilling the mission to educate students, yet the technology employed in support of one unit is often at odds with that used in another. Leadership is key to the success of a learning community (Wenger, White, & Smith, 2009), and the communal aspects of technology imply that it will help find learning

partners and engage them meaningfully (Wenger et al., 2009). Wenger et al. (2009), state that while integration of technology into education is an important technical goal, there are limits to what we can expect directly from technology. Ideally, technology must be applied in a meaningful way to create a relationship between the tool and the educational goal (Wenger et al., 2009). AT professionals on campus are in a position to achieve this relationship, but they are rarely in leadership or influential positions, so despite the importance of well-adapted technology, a comprehensive, integrated view of ATôs role in teaching and learning is often missing. As the 2011 CDW-G Report (Caraher & Braselman, 2011) states, there is a disconnect between the priorities of college administrators and the way in which technology is leveraged in teaching and learning at their institutions.

Statement of Problem

Many higher education institutions do not have an organized AT strategy or AT professionals to implement an AT strategy across campus. There are many individuals who work in the broad field of AT, but they are not able to influence the integration of technology into teaching and learning that will ensure that students receive a relevant education in the 21st century. AT is a nascent field that requires more attention and resources and influential inclusion, but academic technologists are underrepresented in college leadership and have insufficient influence in decisions that affect proper integration of technology. College and university executives view technology as a tool and a service that is used to enhance traditional classroom teaching rather than a way to transform the teaching of skills needed by students entering a knowledge-based society (Bates & Sangra, 2011). AT professionals are on campus but not in a position to influence the way that technology is used in higher education. Problems contributing to this include: technology is constantly changing, the field of AT is ill defined, and AT

professionals have different teaching and learning philosophies. As Figure 1 illustrates, AT is at the vortex of the technological and academic spheres in higher education, and there are many tensions that affect AT decisions. This paper will survey campus AT professionals to investigate their roles, their responsibilities, and their views on whether or not they are in a position to influence the integration of technology into teaching and learning in higher education.

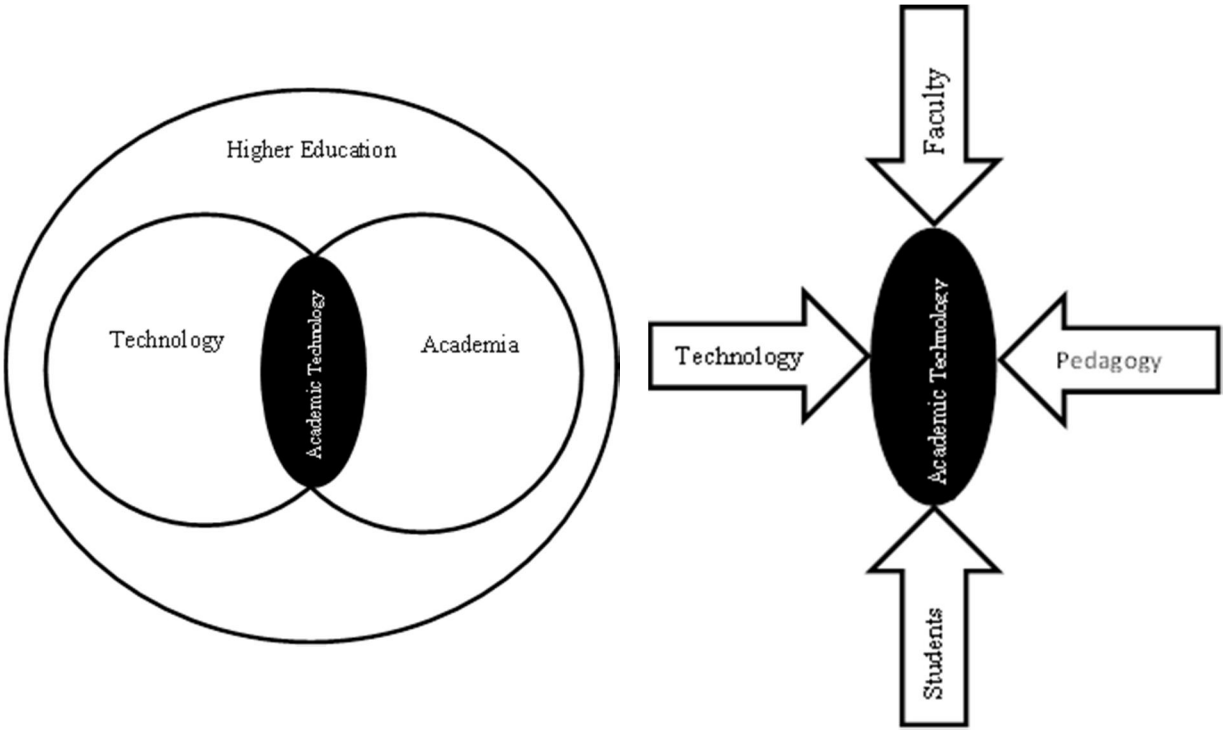

Figure 1. Academic technology in relation to technology, pedagogy and higher education

Statement of Purpose

The purpose of this study was to identify the roles and responsibilities of AT professionals and to discover if there is a gap between what they do and what they believe they should be doing in their jobs.

Research Questions

In order to understand the position and context of AT in higher education, the following research questions were studied:

1. What are the major areas of responsibility of AT professionals?
2. To what extent do AT professionals believe they fulfill their perceived level of obligations across the areas of responsibilities determined in Research Question 1?
3. Is there a gap in performance across the areas of responsibilities?
4. Is there a relationship between the magnitude of the gap in performance in obligations and the professional background and characteristics of the AT professionals?
5. To what extent do AT professionals believe that they participate in institutional AT decision making?
6. Is there a relationship between the magnitude of the gap in performance in obligations and the degree of perceived participation in decision making?

Study Overview

This is a descriptive research project designed to capture a snapshot of the roles and responsibilities of professionals currently working in the AT field on college campuses. Due to the increasingly dynamic nature of the field, few researchers have a clear picture of the professional responsibilities of the individuals responsible for integrating technology into

teaching and learning. Creating snapshots assists professionals in the field to understand their place in relation to the governance and hierarchical structure of higher education institutions. These industry-wide views help explain the full range of AT expertise and influence and the unique place of AT professionals among other technology professionals on campus.

This research aims to provide similar information about AT professionals as do the studies of the roles and responsibilities of CIOsð both those aspiring to enter the field and those that hire the individualsð conducted on a regular basis by both Educause and Dr. Wayne Brown of the Center for Higher Education Chief Information Officer Studies, Inc.

Conceptual framework. Many institutionsô mission statements say that their purpose is to educate and guide students to contribute to society through productivity in the work force. Many institutions dedicate large portions of their budgets to supporting technology specialists charged with determining how technology can directly affect the academic sphere of the institution and, in turn, how technology fulfills its educational mission and goals. The technology program is generally guided by people who can make the technology run, but not usually by individuals who have an understanding of how pedagogy can be supported by technology.

John Nworie concluded in 2005 that further studies in AT were necessary to understand the field and its importance in higher education fully (Nworie, 2005). Among his recommendations for further study, Nworie (2005) suggested research that focuses on the roles and responsibilities of AT professionals and support services. Anecdotal evidence shows that the responsibilities of AT professionals include mastering basic technology skills, training faculty and students to use technology, assisting faculty to develop academic content and effective

transmission of the content, evaluating learning technologies, managing other AT staff, and creating strategic AT governance and policy.

Nworie originally identified possible roles in his 2005 study and then suggested that a study be conducted in order to develop competencies for the positions of AT professionals, which could then guide institutions seeking to fill these positions. This study will survey a significant number of members of the AT community to further clarify Nworieôs findings and identify the various AT professions in higher education, job title, competencies, and responsibilities of these positions. The results of this research will provide a statistical analysis on which these assumptions can be based.

Limitations. Descriptive research studies are designed to provide a snapshot of a situation as it is at a specific period of time. A limitation in this study is the limited scope of the research, the current situation of AT as seen by professionals in the field, which will provide the data for this study. Another limitation is the self-selecting sample that will be solicited. These individuals are contacted cold and do not receive any tangible incentives for participation. The survey in this study has not been used before, so validation and reliability of the questions will be authenticated by experts in the field.

Definitions

For the purposes of this paper the following terms and definitions will apply.

- Academic Technology (AT) is used as an umbrella term to describe the design, development, utilization, management, and evaluation of processes and resources for teaching and learning in higher education (Lamb et al., 2003). AT professionals are those who perform these tasks.

- Instructional Technology (IT) is the theory and practice of design, development, utilization, management, and evaluation of processes and resources for learning. It is a broad field crossing many disciplines within and outside education (Lamb et al., 2003).
- Chief Information Officer (CIO) is the term used for the most senior executive responsible for identifying information and technology needs and delivering services to meet those needs (Broadbent & Kitzis, 2005).

Summary

Colleges and universities must have a strategically guided approach to technology-mediated instruction (Privateer, 1999). For this to occur, technology must be integrated into the curriculum. AT personnel, who are at the meeting points between IT and academia, are the people best positioned on campus to ensure integration. However, although AT professionals are found on campuses, they tend not to be in positions of influence. Technology is constantly changing, the field of AT is ill defined, and AT professionals have different teaching/learning philosophies.

This research is focused on clarifying the roles and responsibilities of AT professionals and assessing their perception of the influence and leadership they have regarding technology in academics on campus. Although the population that will be surveyedð individuals who identify themselves as part of the AT professionð is self-selecting and has its limitations, it is expected that insights gained into their perceptions of their field will allow researchers to begin to define the field of AT. A clear definition and understanding of the influence of AT professionals is the first step to creating a professional community that will be able to unite and define itself both internally and externally.

Chapter 2: Literature Review

This literature review will focus on the evolution of AT, beginning with delineating expectations from the consumers of technology in higher education: faculty and students. The review will continue with a brief discussion and clarification of the broad IT area and the CIO at its head. A section is devoted to explaining the differences between the roles of CIOs and AT professionals, management, and leadership. This review includes a section on the evolution of the AT field, with professionals playing a variety of roles in it, out of the broader IT sector. The roles consist of various competencies and skills. The literature review concludes with an examination of management, leadership, and AT integration.

Technology in Teaching and Learning

IT is a broad area that spans the business world and the educational sphere. Corporate America has integrated technology and witnessed increased productivity and effectiveness as a result, while higher education is still trying to apply it to its core processes of teaching and learning (Yulong & Runyun, 2004), having successfully adapted some of its business management uses. This stems from the adoption of IT resources by universities in areas where IT had a successful track record, primarily in administrative, financial, and student and alumni database management systems (Brown, 2004), ensuring that the institution runs as a business. The more experimental and untested areas of integrating technology into teaching and learning have been ñlate to the party.ò

Faculty. The 2011 CDW-G Report (Caraher & Braselman, 2011) states that faculty want help integrating technology into their teaching from professionals who understand teaching. Technology adds new levels of complexity and requires new knowledge and skill sets. It is very difficult, if not impossible, for an instructor to innovate or teach differently from the traditional

model if they have no understanding of possible and alternative ways to teach that are based on theory and research. One body of evidence shows that teaching methods and curriculum design affect deep, autonomous, and reflective learning, which should be the goal of all teaching. Yet most faculty are largely ignorant of this scholarship, and instructional practices are dominated by tradition (Bates & Sangra, 2011; Yulong & Runyun, 2004) rather than innovative approaches.

Instructors need to understand how technology can be used appropriately for studying and to ensure that teaching makes the best possible use of available technology. In addition, some students will need more help than others in using technology for learning, but all students will need to learn how to integrate technology successfully into their learning (Bates & Sangra, 2011). In short, what is needed is a requirement that institutions provide initial and continued faculty training in the use of technology in their teaching (Bates & Sangra, 2011; Yulong & Runyun, 2004).

New models for teaching and learning need to build on the strengths and opportunities that technology provides, based on an understanding of how students learn and how best to teach (Bates & Sangra, 2011; Yulong & Runyun, 2004). AT professionals, with their dedicated understanding of technology use in education, are best suited to assist faculty in integrating technology into their teaching and thus ensuring that students are prepared to use and learn from technology once they enter the work force.

Students. Traditional institutions of higher education are facing a new reality in which accepted knowledge on a topic is changing at a rapid pace. It has been estimated that knowledge has a half-life of 4 years, meaning that half of the information that a student acquires in the first year of study will be irrelevant by the time he or she graduates. One of the goals of education must be to teach the student how to learn, and, according to Evers, Rush and Bedrow (1998), one

way to achieve this is through competency-based education in which students learn to perform in an ever-changing environment.

Full-time students on campus have frequently reported that they do not expect technology to replace face-to-face contact with their instructor, yet they expect instructors to help them know how best to use technology for learning (Bates & Sangra, 2011; Yulong & Runyun, 2004). In particular, studentsô use of the internet for social and personal purposes does not necessarily prepare them adequately for academic applications of the internet, such as searching for reliable sources of information (Bates & Sangra, 2011). There are also inherent requirements in education, such as a disciplined approach to study, critical thinking, and evidence-based argumentation, that cannot or should not be abandoned because they do not fit a particular studentôs preferred learning style (Bates & Sangra, 2011). Given this knowledge, technology skills need to be embedded within the subject matter or knowledge domain. Thus, there are implications for setting learning goals, curricula, teaching methodology, and assessment through AT. Each of these areas must be addressed if the learning goals for a knowledge-based society are to be achieved (Yulong & Runyun, 2004).

Information technology and the CIO

The areas of IT and AT are closely connected. In institutions of higher education, technology is being used to expand educational opportunities through complex data handling, distance-learning environments, and real-time, global, inquiry-based learning (Lamb et al., 2003). However, IT departments have historically been considered indifferent at best, and openly resistant at worst, to the needs of some of their customers, namely students and faculty (Brown, 2004).

There is little doubt that technology has the potential to enhance teaching and learning and will undoubtedly have a considerable impact on the next generation of leaders, but there appears to be a lack of consensus, both in theory and in practice, on how technology should be used and integrated in universities (Yulong & Runyun, 2004). Administrative decision makers in education have become information managers, with technology driving many academic decisions. IT is at the center of the educational administration structure, system, and process (Sellers, 2005).

The vagueness of role definition for AT professionals is a fairly recent issue for colleges and universities, due in large part to the fact that the IT department, with the CIO at its head, is a relative newcomer to academia. Nworie (2005) states that in basic role theory, the clear identification of roles performed by individuals in an organization helps to minimize ambiguity and increases a personôs sense of accomplishment. The role of the CIO and IT department on campus and elsewhere has changed rapidly from a support position to one that is critical to the survival and mission of the institution (Brown, 2004).

In some universities, the IT department may be divided into administrative and academic computing areas, with each one having different reporting structures and funding sources. This situation can lead to communication and action gaps between IT and other departments. The gaps can result in a variety of dysfunctional outcomes, with the IT department held accountable, at least partially, for multi-million-dollar failed projects, inefficient operations, and the inability of other departments to focus on their jobs. It is not surprising then, that the IT department can become unresponsive to the needs of the students and faculty and the organizationôs goals and mission (Brown, 2004).

Chief information officers. In general, a CIO is responsible for the administrative systems and for implementing technology that will contribute to helping the institution achieve its primary objectivesð education and research (Brown, 2004), although the areas that the CIO is responsible for can vary by institution. In some settings, the CIO may oversee all administrative and academic computing, integration of technology into the curriculum, residence hall computing, and telephony, among other responsibilities. Alternatively, the CIO may only be responsible for some of these functions, with other departments responsible for the remainder. The CIO may be responsible for the widespread adoption of the World Wide Web; portals; electronic commerce; distance learning; course management systems; ubiquitous use of email and network file storage; and the use of institution-wide Enterprise Resource Planning systems to accomplish the business of the institution. The position the CIO holds within the organization is an expression of the value it places on IT and its understanding of ITôs role in achieving institutional goals. Further, the CIOôs job definition may affect the organizationôs perception of IT. According to Brown (2004), there is a correlation between the CIOôs attributes and his or her effectiveness in all of the CIO roles (Brown, 2004). The CIO no longer needs to be a master of all the technical details; rather this person needs a broad knowledge of technology, but more importantly, should contribute to and have a comprehensive understanding of how IT helps the organization achieve its goals and mission (Brown, 2004).

CIO leaders and managers. Because of the emergent level and nature of the leadership demands on the CIO, Broadbent and Kitzis (2005) and others have elevated the role of the CIO to that of a leader, to distinguish the position from IT managers. New CIO leaders must know the enterprise thoroughly inside and out, if not better than their executive colleagues (Broadbent & Kitzis, 2005).

CIO management is about execution and control. It is focused on participating in the articulation of institutional vision and mission in order to get things done and do things better. CIO leadership builds credibility by ensuring the institutionôs capacity to deliver outcomes important to executive, faculty, and staff colleagues alike, as well students and alumni, all of which contributes to the successful delivery of other projects. The elements of leadership, vision, communication, and relationship-building are important to all leadership roles within the organization (Broadbent & Kitzis, 2005; Goleman, 2000; Kotter, 1996). Naturally, the CIO must also be a master of the fieldð its theory, practice, implementation, and evaluation, not to mention hardware and software.

Chief information officers in the academic sphere. In many institutions, the individual designated to make, or at minimum recommend, AT decisions is the CIO, who is usually charged with providing central, comprehensive IT leadership for the institution. Among this positionôs most common responsibilities are ensuring that central technology systems are properly integrated, securing economies of scale in operations and procurement, and advocating for strategic applications of information technology across the institutionôs academic and administrative domains (Jackson, 2010). Senior academic administrators rarely have any formal training in the management issues surrounding technology decision making and sometimes have little familiarity with technology at all (Bates & Sangra, 2011); they must, therefore, rely on the

CIO to provide leadership on the best way to leverage technology, solve problems, create value, and effect change (Chester, Canning, & McNayr, 2009). The CIOôs main challenge is to ensure that the institution uses information technology to its maximum long-term benefit (Jackson, 2010).

In many institutions, the CIO makes decisions that affect institutional mission and program, and these decisions can have significant consequences for students and faculty. Therefore, the university CIO must have a broad, theoretical understanding of AT and its use in supporting the institutionôs academic mission (Sellers, 2005). Technical skills are not enough to ensure the CIOôs success; it is essential that the IT leader be aware of, and proficient in, all aspects of the job (Brown, 2004).

Technologies for teaching and learning. According to Bates and Sangra (2011), often technology for teaching is seen as something that is desirable and nice to have rather than as a core component that needs to be funded adequately. Some institutions deploy a *build it and they will come* approach to teaching technologies, in which the technology leadership provides faculty and students with access to a technology infrastructure and devices and assumes they will figure out on their own how to integrate them into teaching and learning. This method has proved to be a disappointment to the institutions that have embraced it (Bates & Sangra, 2011). The CIO who does not understand pedagogy or speak the language of education is not necessarily the best person to make decisions regarding academic technologies on campus.

Many institutions of higher education combine the technologies used for teaching and learning and the support for computers and other administrative technologies into one portfolio managed by the CIO, but some now suggest that all these no longer have to be managed centrally by the same department (Jackson, 2004). Decentralizing these technologies by separating the

institutionôs administrative needs and AT needs will close the gap between what is available and what is needed for teaching, and in the end better serve the needs of both the faculty and the students. In this scenario, the CIO leads the administrative technology initiatives and a senior AT officer leads the AT initiatives. Technology is best integrated into teaching and learning when the related decisions are made in conjunction with other academic decisions such as content, pedagogy, and teaching methods (Bates & Sangra, 2011).

Technology or pedagogy. Technology supports the initiatives that are critical to the operation of the higher education institution (Brown, 2004), yet technology alone is not sufficient to ensure studentsôsuccess when they graduate and enter the work force (Chester, 2011). As the work environment changes, so do expectations and accountability (Sellers, 2005) which makes it critical to hire, assess, and retrain staff based on competencies rather than on technical skills (Chester, 2011). The strategic importance of technology has increased and entrusting it to a single individual can be dangerous for an institution, especially if that individual, though expert in technology, cannot speak the language of education (Jackson, 2010). An effective centralized IT department will understand that academic technologies are mission critical to the institution and ensure that the individual who is responsible for that particular aspect of technology is someone who is versed in pedagogy with strengths and understandings of technology.

Academic Technology

History of academic technology. Scholars have written histories of technology in education that include the illustrated textbooks of Johann Comenius in the 1650s (Nworie & Albright, 2008), the blackboard that became standard in classrooms by the 1830s, and the hand-held stereoscope in the 1850s (Molenda, 2007). In the 17th century, slide projection with hand-painted slides illuminated by oil lamps became popular, though expensive to use. After Thomas Edison invented incandescent lighting in the 19th century, slide projection became common for educational use in schools (Molenda, 2007).

The first silent films in education began around 1910 with short films of scientific wonders, such as microscopic creatures, and news events (Molenda, 2007). Interest in using films in educational settings grew and led to the emergence of the visual instruction movement, whose advocates sought to make visual materials, such as film and still pictures, easily available to educational institutions. In the 1930s, the standardization of media enabled the schools to maintain equipment pools and media service units (Molenda, 2007).

Broadcast technologies. The 1920s and 30s also saw the rise of broadcast radio, with educational and instructional broadcasts assumed to be a primary use (Molenda, 2007). Colleges, universities, and school districts were granted broadcast licenses and created educational programming. Radio, and then television, programming did not play core instructional roles in educational settings, primarily because of the advantages of broadcast media. Broadcasting implies coverage of a large area, often crossing district and even state boundaries. This made it difficult to create lessons that would meet the curricular scope and demands of individual schools (Molenda, 2007). The 1960s saw a rapid introduction of technology devices into schools.

Teaching machines were introduced into instruction and intended to deliver lessons and content and schools began to hire audio visual coordinators to program and support these machines.

Personal computers. Over the following two decades, computer technology became more personal and affordable, and by the end of the 1980s, personal computers were common in the classroom. However, Molenda (2007) noted that access to hardware does not equate use and he cites surveys conducted by Plomp and Pelgrum in 1991 and 1993 that reported ñonly a small percentage of teachers who had access to computers actually integrated their use significantly in the teachingò (Molenda, 2007, p. 16). Computers were primarily used to learn ñaboutò rather than ñwith.ò Papert stated that the computer was being used to program the child, rather than the child learning to program the computer (Papert, 1993).

Thinking and media. The 1960s were pivotal in the history of technology in education. At the time, James D. Finn, an education instructor the University of Southern California and a pioneer of educational technology, believed that educational technology consisted of a way of thinking about instruction, and not just the devices that were used (Molenda, 2007; ñJames D. Finn,ò 2010). From this point on, technology meant ñscientific thinking and communications media and devicesò (Molenda, 2007, p. 12). As the decade progressed, audio visual gradually became instructional (Molenda, 2007; Nworie & Albright, 2008). According to Molenda, the ñreorientation of the field can be seen as a major paradigm shift, from the creation and use of audio visual media or the communication of messages to the design of learning environments according to a specific set of psychological specificationsò (2007, p. 12).

The president gets involved. In 1969 President Richard Nixon established the Presidentôs Commission on Instructional Technology, chaired by Sterling McMurrin, dean of the University of Utahôs graduate school. The commission established two definitions of instructional technology. The first focused on technology as a ñmedia,ò a communication aid teachers use for instructional purposes, such as the blackboard (Nworie & Albright, 2008). The second focused on the systems-design approach to pedagogy.

Definition 1. The first definition is based on communication theory of learning that emphasizes the design of instructional messages. According to Lev Vygotsky (1978), all learning involves language, and the techniques and tools for expressing and sharing languageð communicationð are a fundamental aspect of thinking and learning (Lowenthal & Wilson, 2009; Spector, 2007). Communication theory is one aspect of human-computer interaction, which is considered an applied foundation of educational communication and technology research (Spector, 2007).

Definition 2. The second definition identified instructional technology as a systematic way of designing, carrying out, and evaluating the teaching process to bring about effective instruction (Nworie & Albright, 2008). This definition emphasizes a systems approach to instructional technology. The systems approach divides the instructional planning process into steps and arranges those steps into a logical order in which the output of one step leads into the next (Lowyck, 2007; Molenda, 2007), thus forming the basis for instructional design.

A field is born. In 1977, Kenneth Silber and the Association for Educational Communications and Technology (AECT) wrote ñThe Definition of Educational Technologyò which defined educational technology in 16 parts, intended to be taken as a whole (Silber, 1977). AECT freely interchanges the labels of educational technology and instructional technology

(Lowenthal & Wilson, 2009; Silber, 1977). One of AECTôs goals is to give structure to the application of technology to education. The first part of AECTôs definition states that educational technology is an applied field, embracing concepts, skills, and procedures from a number of academic disciplines and other applied fields and melds them into new applications. AECT emphasizes that technology in education is not the same as educational technology. Educational technology is a complex, integrated process involving people, procedures, ideas, devices, and organizations for analyzing educational problems and devising, implementing, evaluating, and managing technology-enhanced solutions to those problems (Silber, 1977). It is incumbent on the educational technology professional to ensure that this process is successfully applied to instruction.

The field of AT is an amalgamation of several different roles and departments within the higher education community. In many instances the roles and functions in AT are divided among information technology units, media support units, instructional design units, and computer technology support. Because of its broad nature and application, the umbrella field of AT lacks clearly defined roles, responsibilities, and core competencies that allow individuals to provide leadership and management in higher education. Kenneth Greenôs 2010 and 2011 Campus Computing Reports (Green, 2010, 2011) found that two of the top ten technology issues in higher education are the investment in instructional integration of technology to support teaching and learning and hiring/retaining qualified staff (Green, 2010, 2011). As the investment in, and importance of, learning technologies grow, describing and standardizing the professional qualities and skills of AT specialists and their optimal academic preparation, as well as clarifying roles and influence paths, are important and timely goals. According to Bates and Sangra (2011), successful technology integration into institutions of higher education requires equal attention

being paid to three elements: pedagogy, technology, and organization. The goals for AT integration are essentially academic rather than technological, although technology obviously plays a critical role in the strategies used to achieve the academic goals (Bates & Sangra, 2011). The field of AT has continued to grow largely due to the emphasis on pedagogy, as opposed to technology, when applying technology to achieve academic goals (Nworie, 2005).

Academic Technology Professionals

People come to AT from a variety of professions (Lamb et al., 2003), which contributes to the myriad of definitions, roles, responsibilities, and competencies found in the field (Silber, 1977).

Competencies of academic technology professionals. One goal of this study is the exploration, through empirical research, of the roles and responsibilities current AT professionals deem to be the most important to their job performance. This will enable us to posit an ideal, and perhaps standardized, agenda for the professional preparation of AT and IT specialists, including CIOs. According to Evers, Rush, and Berdrow (1998) the basic competencies encompass the following interrelated skills: managing self, communicating, managing people and tasks, and mobilizing innovation and change. Skills are not possessed in isolation; they are associated with knowledge, values, and each other, and they reinforce one another (Evers et al., 1998). Managing self refers to the ability of a person to continually develop professional skills to cope with a constantly changing environment (Evers et al., 1998). As new technologies are being developed quickly, an AT professional must have a vast repertoire of technology skills and the ability to adapt the technology for appropriate pedagogic use. Evers et al. (1998) point out that learning is the ability to gain knowledge from everyday experiences and to keep up-to-date on developments in the field.

Competencies. Competencies are linked to effectiveness and by elevating pedagogic competencies over technical skills, an AT department will be in a better position within the organization to increase the value of the services that it provides (Chester et al., 2009). AT leaders should be considered thought leaders (Chester, 2011) of the institution and become advocates for effective and appropriate delivery of academic technologies.

A technology division staffed with people who possess only technology skills finds itself playing the role of a utility provider, which is important, but not strategic. The technology skill-based leader will remain the provider of technology as a utility service rather than as a thought leader who will focus on building the alliances and partnerships necessary for innovation or organizational change. Conversely, a technology provider who cannot provide continuous and sustained technology services may not be seen as a credible thought leader (Chester, 2011).

Skills. Skills can be viewed on a continuum of low to high levels of proficiency. They are not learned in isolation but are built on each other, moving from basic to expert. Further, skills are associated with knowledge and values. They are interconnected with and reinforce each other (Evers et al., 1998). According to Evers et al. (1998) a value is an abstract, generalized principle of behavior to which members of a group feel strong, emotional, and positive commitment. The value provides a standard for judging acts and goals. Evers et al. (1998) add that values create a context for the use of skills and application of knowledge.

The skill of communication is extremely important for the AT professional, who is responsible for helping faculty use new technologies in their teaching and learning. This person must be able to communicate with facultyð verbally, non-verbally, and visuallyð using communication skills that are clear, succinct, and understandable to personnel with far less technological training. This demands using non-technical, and even sometimes non-pedagogic,

language. Often in institutions of higher education, AT projects are done on a large scale, such as implementing a campus-wide LMS. The AT professional must have the ability to manage people in both technological and academia spheres. To be in charge of AT support services, the individual must also possess leadership skills that include the ability to conceptualize a project and manage change (Evers et al., 1998).

Career ladders. Career ladders, desired competencies, and clear performance benchmarks are important to employees so they know what is expected from them and what they need to do to be promoted. Promotions are important to employees because they tend to mean more money and higher recognition by supervisors (Troia, 2006). By keeping advancement criteria aligned with the vision and mission of the organization, managers can avoid the ambiguity that employees often feel when it comes to promotions and recognition for the work that they have done (Troia, 2006). A well-defined career path allows employees to feel in control of their job advancement (Troia, 2006) and the professional development needed to meet the demands of the job.

John Nworie's 2005 academic technology support services study. One of the seminal studies in the AT field was done in 2005 by John Nworie. The goals of Nworieôs 2005 study of Academic Technology Support Services (ATSS) in American higher education were to determine the current and future roles and responsibilities of these units in colleges and to identify and prioritize the current, emerging, and future roles and responsibilities (Nworie, 2005). Nworie had three criteria for his study, defining the scope of the service responsibilities of the ATSS as servicing classroom technology, online learning, and faculty development. The professionals he surveyed were required to be a dedicated resource to AT and be no lower than two administrative echelons to the vice president in the reporting chain (Nworie, 2005).

Nworie surveyed 150 institutions, and only 10% had positions that met the three requirements above. The respondents identified and prioritized what they believed were three responsibilities of the ATSS: 1) assisted faculty in their roles as teachers; 2) improved student learning; and 3) supported the institutionôs instructional goals. Ninety percent of the institutions that participated in Nworieôs study did not have an AT professional in a strategic position at the institution. The institutions stated that centralizing leadership of AT was not a priority. Many of the institutions reported that they either 1) had multiple ATSS units without a common administrator; 2) had a single ATSS unit at a low echelon; or 3) had no ATSS unit at all (Nworie, 2005). Nworie (2005) concluded his survey with a discussion of areas needing further study and this dissertation will continue the study of AT professionals in higher education.

Academic Technology Roles

Today, AT is an integral and essential component of almost all core higher education activities and needs to be managed as such (Bates & Sangra, 2011). AT professionals are often identified as administrators in the organization (Nworie, 2005). Thus, they are considered to be supervisors in both the administrative and the academic domains of a college or university. Their administrative challenge is to support institutional efficiency and continually monitor the cost-effectiveness of the applied technology, while their academic challenge is to help maintain the quality of the education program and the proper application and implementation of technology in the curriculum and teaching on campus (Sellers, 2005). As in many non-profit organizations, these tasks may pose conflicting challenges. With expanding technology options available to them, administrators are frequently making incremental decisions and rationalizing the technologies used to produce those decisions (Sellers, 2005).

Support. In their academic roles, AT professionals are charged and specifically designated by higher education institutions to oversee and support the use of every aspect of instructional technology campus-wide, including the use of media, instructional development, and management of technology and media resources. These positions often include, but are not limited to, the supervision of distance educators, curriculum specialists, and information specialists in addition to their role in support of more basic faculty teaching and student learning (Lamb et al., 2003; Nworie, 2005).

Many non-traditional campuses are demanding new and flexible means for learning, necessitating novel teaching methods and organizational change (Deden, 1998; Sellers, 2005; Yulong & Runyun, 2004). Therefore, AT professionals, no matter the level of technological engagement or integration, still need to emphasize educational standards, speak the language of the academy, and possess an understanding of faculty and students, that will allow them to build effective and feasible instructional models that integrate AT with faculty resources and produce the optimal teaching and learning academic environment (Yulong & Runyun, 2004).

The myriad functions and responsibilities of AT professionals calls for a better understanding and updated view of these diverse, complex, and multi-faceted roles and responsibilities (Nworie, 2005). Understanding the current roles and responsibilities of AT professionals will assist institutions in making decisions about issues affecting the AT unit and guide them in evaluation and long-term strategic planning (Nworie, 2005).

Strategic planning. Strategic planning is important for all institutions, and the academy will be well served by including AT professionals in the process. These professionals will bring to the table the role of technology in achieving learning outcomes in a knowledge-based society; developing specific competencies in the use of information and communication technologies within specific academic disciplines; generating flexible program delivery methods to accommodate a wider and more diverse student body; redesigning courses to better integrate technology; and increasing efficiencies by using technology to achieve better outcomes at a lower cost (Yulong & Runyun, 2004).

Instructional design. Instructional design and development are human activities, the purpose of which is to facilitate and support human learning and performance. Charles Reigeluth (1999) states that instructional design theories require two methods, one facilitating human learning and the other supporting development of instruction. It is incumbent upon the instructional designer to know when to use these methods and in which situations not to use them.

The American military viewed the systems approach as a paradigm for combining the human element with machine elements. In the 1970s, this approach became ñinstruction systems designò (ISD) (Molenda, 2007). One of the more popular ISD models is the ADDIE framework: analyze, design, develop, implement, and evaluate. Though ADDIE largely failed in educational settings, by the end of the 1980s, skill in instructional design was viewed as a core competency of the educational technology professional (Molenda, 2007).

The world wide web. The mid-1990s saw a coupling of the Constructivist learning movement and the World Wide Web. Instructional design focused on using popular educational technology tools, such as WebQuests and simulations, to create experiential learning environments. By the end of the decade, web-based courses and virtual schools became popular as a method of distance education (Molenda, 2007). Thus, the instructional designer became an integral figure at educational institutions (Molenda, 2007).

Academic technology delivery models. The third millennium is heralding an emergent landscape of different educational delivery models, ranging from traditional face-to-face (FTF) instruction to fully online (OL) courses (Hill, 2012). Traditional FTF courses, where the instructor and students are physically located in the same place at the same time, may or may not include technology components, depending on the preference of the instructor.

A blended or hybrid course delivery method combines FTF and OL course delivery methods. The ratio and delivery of FTF and OL content varies by instructor, course, and institution. Common trends include an instructor-centered FTF session, where the content is delivered by the instructor and resource materials are available OL; and the ñflippedò classroom, where content is delivered OL and FTF time is used for practice and application (Hill, 2012).

One method of delivering fully OL courses is by using the concept of a master course. Master courses tend to be developed by instructional design teams that include multi-media experts, quality assurance people, instructional designers, and subject matter specialists (usually faculty) (Hill, 2012). The master course is replicated into multiple, relatively consistent sections in a repeatable manner (Hill, 2012).

Another method for OL delivery is the use of Massive Open Online Courses (MOOCs). This design process replaces the master course concept and leverages the natural scaling power

of OL tools (Hill, 2012). MOOCs are characterized by the large, or massive, number of students who enroll in them. Many of the courses are self-designed by faculty, who are most often not trained in effective instructional design or teaching (Holton, 2012). Doug Holton at the Center for Teaching and Learning Excellence of Embry-Riddle Aeronautical University, blogged that ñMOOC providers have not hired anyone trained in instructional design, the learning sciences, educational technology, course design, or other educational specialties to help with the design of their courses. They are hiring a lot of programmers and recruiting a lot of faculty, who may have various motivations for participating in these open education experimentsò (Holton, 2012).

Faculty development and support. Early studies conducted on the use of visual instruction and technology concluded that the educational value of media was not in their quality, but rather in how well the teachers used them in class (Molenda, 2007). Technology only creates high-quality learning output if sufficient support is available, and IT staff is an integral part of the curriculum and learning environment (Lowyck, 2007). Molenda (2007) confirms these findings in studies of educational effectiveness with every introduction of new media into instruction throughout the history of educational technology. Still, institutions of higher education are spending great portions of their budgets on technology devices and platforms (Arroway & Sharma, 2009; Green, 2009), often without the requisite investment in human resources, namely, the AT professionals needed for the successful integration of the technology to ensure educational effectiveness.

Academic Technology Management and Leadership

According to John Kotter (1996), leaders define what the future should look like, align people with that vision, and inspire them to make it happen despite obstacles. Kotter suggests that many people can strengthen their leadership skills by modestly assisting with the leadership agenda in their sphere of activity.

Leading from any chair. In their book, ñThe Art of Possibility,ò Zander and Zander (2000) liken organizational leadership to conducting an orchestra. Maestro Ben Zander (2000) describes how the orchestras that he has conducted embrace the music and vision of the piece when the players are part of the conducting process. Zander effectively enables his players to envision the result. As conductor, Zander must foster trust between him and his musicians. When trust is established, Zander becomes a conduit for the realization of the vision. The authors conclude that the activity of leadership is not limited to the executives, but to all those people who can energize movement in the organization (Zander & Zander, 2000).

Managers or leaders? Are AT professionals managers or leaders in their institution? As in many professions, the answer is both, depending on role and professional personality. Leadership and management are not the same, although they are complementary skills. Leading is about vision, change, and influencing others to change (Broadbent & Kitzis, 2005; Kotter, 1996), while managing sees technology as a utility (Jackson, 2010).

According to Evers et al. (1998), managing people goes beyond supervision; it encompasses the ability to motivate people to gain high levels of achievement in a competitive and changing technological world. Effective managers become involved with their staff, sharing their concerns, and supporting and guiding them and their work (Evers et al., 1998); they demonstrate the ability to plan, organize, coordinate, and guide resources and people (Blanchard

& Hersey, 1977; Blanchard & Johnson, 2003). This differs from leadership: Leaders must conceptualize, initiate, and mobilize projects and give direction and guidance to others who manage the resources (Evers et al., 1998).

Management. Technologies, just as utilities, should be consistent, pervasive, and ubiquitous across the institution. They require competent operational management, but not necessarily leadership skills (Jackson, 2004). Technology managers often lack theoretical or conceptual frameworks for how the Internet and relevant technologies should be integrated into institutions of higher education (Yulong & Runyun, 2004). AT leaders must have a higher level of responsibility for technology used in teaching and learning, including the ability to distinguish between day-to-day operations and strategic leadership (Jackson, 2010).

Leadership. Like CIOs, AT professionals must lead development and innovation and not just manage the technologies used for teaching and learning on campus. Using technology for teaching is a necessary, but not sufficient, requirement for students developing the knowledge and skills needed in the 21st century. It has to be accompanied by curriculum reform, changes in teaching methods that facilitate the development of skills in a particular subject domain, and by changes in assessment, to ensure those skills are evaluated (Bates & Sangra, 2011). These additional responsibilities and successful change require leadership skills.

AT leaders need to facilitate a collective approach to setting and implementing goals that are aligned with institutional vision. In particular, all members of the executive team need to be on the same page regarding the need for change in teaching and the importance of technologyôs role in transforming teaching and learning. They also need to understand the financial implications when making this commitment. The key role for the executive team is to ensure that

there is a comprehensive governance strategy in place for technology with includes its use for teaching and learning (Bates & Sangra, 2011).

It must be noted that leadership alone will not result in technology integration. Support and acceptance from a wide range of stakeholders is necessary for success, and this means putting in place a wide range of activities and positions that will facilitate technology integration.

Because of the dynamic nature of technology, a governance structure needs to be designed that enables decisions about technology to be made by the right people at the right level (Bates & Sangra, 2011), especially with the involvement of an AT professional. Further, formal training in modern teaching methods is an essential requirement for the effective use of technology in teaching (Bates & Sangra, 2011).

Senior administrators are often aware of the need to change, but are sometimes constrained by the barriers of organizational culture, and in particular, by facultyôs strongly held beliefs about, and comfort with, traditional teaching methods, the privilege of research, and the mistrust of formal training in teaching. AT professionals who are not tenured faculty often have a difficult time acting and being accepted as change agents. These barriers are not easily overcome by short-term incentives and need strong, continuous internal leadership (Bates & Sangra, 2011).

Lack of academic technology integration. Bates and Sangra (2011) contend that some of the issues hindering the successful integration of AT into the academy include the lack of a clear vision for a technologically rich environment; clear and measurable goals for technology investment and applications; governance and management of information technology; poor educational program design; the lack of strategies for coping with the pace of technological change and development; and the measurement of performance. As referenced by Albright and Nworie (Nworie & Albright, 2008), Peter Galbraith, former professor at Windham College,

observed that a lack of leadership hindered the integration of technology in the teaching and learning process. Kowch (2005) found that few educators and fewer educational technologists are found in influential education leadership networks and that major educational technology decisions and initiatives are decided and led by administrators who have no educational technology experience or understanding.

The biggest constraint hampering higher educationôs adoption and integration of technology is not technological resources, but faculty development (Yulong & Runyun, 2004). Faculty members are highly autonomous and possess different levels of technical skills and interest in technology. In fact, the process and nature of technology integration in the curriculum differ not only among, but also within, academic disciplines (Yulong & Runyun, 2004). Contrary to Druckerôs (1999) prediction, traditional university higher education will still be the dominant campus model, even as technology will incrementally enhance traditional teaching methods and the learning experience for students.

Without addressing these hindrances, the use of technology in teaching and learning has merely resulted in increased costs. There has been little done to address the need to change a teaching model that serves mass higher education poorly and does not make the best use of technology. To fully integrate technology into teaching and reap the benefits of a technology-enhanced education, it may be a necessary first step to engage faculty in the use of technology for teaching, although this does not necessarily lead to fundamental changes in their teaching practice (Bates & Sangra, 2011).

Summary

This literature review has demonstrated that much has been written about the management and leadership of technology divisions in higher education. Technology has been utilized in education for hundreds of years, yet appropriate pedagogic integration of technology into the curriculum is not ubiquitous. The field of AT has evolved to concentrate on the goal of advancing educational technology so that it enhances teaching and learning in higher education. A myriad of suggested responsibilities for AT professionals exists: Among them are technology skills, faculty training and professional development, instructional design, evaluation and assessment of instructional technology, and staff management and leadership.

Much has been much written regarding the need to define the profession and field of AT, but little has been written about the leadership and influence of AT professionals on college campuses. Many professionals in higher education identify themselves within the broad field of AT, yet few are found in influential and leadership positions. The leadership roles are occupied by CIOs (Bates & Sangra, 2011), leaders who are concerned with the implementation and maintenance of technology within all domains throughout the campus.

Technology in education is a dynamic and changing field where technology changes along with its uses and influence in general. Each new technology integrated into education brings with it new people with different backgrounds to the field of AT. The literature shows that the AT leader needs to be concerned with the integration of technology into teaching and learning on campus. Chapter 3 describes the method that was employed in this study of AT professionals to help better understand the extent of their impact in their institutions.

Chapter 3: Research Design and Methodology

The value of technology rests in the quality and effectiveness of the activities that it supports. Technology in education is not a new phenomenon, but the speed at which technology changes and different technologies are introduced into education is constantly increasing. The AT field directly supports technologies that are used purposefully to enhance teaching and learning in higher education. Colleges and universities are making substantial investments in technology platforms to achieve their mission of educating students to have meaningful and productive lives in the workforce and in the community at large (Arroway & Sharma, 2009; Green, 2009).

IT departments, under the leadership of the CIO, often make decisions regarding technology investments and usage based on non-academic criteria that are not always attuned to the needs of faculty and students. AT professionals are the bridges between the administrative departments (including IT) and the academic realm on campus. These individuals are versed in both technology and academic fields and are able to move comfortably in both sectors. However, many higher education institutions do not have an organized AT strategy that extends across campus, nor do they have AT professionals with sufficient influence to implement campus-wide improvements.

Contributing to the problem are the dynamic nature of technology use in teaching and learning and a broadly defined AT field, making it difficult for some AT professionals to easily explain what they do (Donaldson, 2012). This study sought data to clarify the position of AT professionals, their roles, and their ability to establish priorities and policies for integrating technology into teaching and learning. Specifically of interest was whether or not AT professionals can influence decisions that set strategic goals and strategies for learning

technologies, allocate resources, approve projects and evaluate the effectiveness of technology strategies at their institutions (Bates & Sangra, 2011).

This study ascertained the responsibilities of AT professionals based on what they self-report their duties *are* and what they believe their responsibilities *should* be to identify perceived gaps in responsibilities and how they affect the influence that AT professionals currently have on college campuses.

Restatement of Research Questions

The research questions are:

1. What are the major areas of responsibilities of AT professionals?
2. To what extent do AT professionals believe they fulfill their perceived level of obligations across the areas of responsibilities determined in Research Question 1?
3. Is there a gap in performance across the areas of responsibilities?
4. Is there a relationship between the magnitude of the gap in performance in obligations [see Question 3] and the professional background and characteristics of the AT professionals?
5. To what extend do AT professionals believe that they participate in institutional AT decision making?
6. Is there a relationship between the magnitude of the gap in performance [see Question 3] and the degree of perceived participation in decision making?

Methodology

This section will describe the research design, the subjects, and the procedures that were used in this study. The design section presents the blueprint, while the subjects section describes the individuals who were solicited to participate in this study. The data collection instrument, the

techniques used to gather the data, and the methods to analyze the data are described in the ñData Analysisò section. Also included in this chapter is a section on ñEthical Considerations,ò which outlines the steps taken to ensure the privacy of the subjects and minimize any risk to the study participants. The results of the data analysis and the conclusions are the subjects of Chapters 4 and 5, respectively.

Research Design

This research is a descriptive study based on factor analysis methodology. Descriptive research questions, such as those in this study, are asked in order to describe a situation at a specific point in time. This descriptive study summarizes the current status of AT professionals in higher education, a valuable and needed first step to investigate this area (Mcmillan & Schumacher, 2010).

The goals of this research were twofold:

1. To create a snapshot of AT professionalsô current roles and responsibilities in higher education and the perceived influence that they have at their institution.
2. To gain an understanding of what AT professionals believe their roles, responsibilities, and influence *should* be at their institution.

In addition to other anticipated outcomes of this study, the conclusions may assist in addressing ambiguities in the field as it is currently constituted, namely, the lack of precision and clarity in delineating the roles and responsibilities of AT professionals. The results of this study can also help clarify roles and expectations and thereby improve the field. Further, this study will assist those who want to work, and institutions that want to hire people to work, in the field of AT.

Subjects and Sample

The subjects of this study are the perceptions of current AT professionals in higher education whose primary function is to serve their academic communityð faculty and studentsð by creating technology-enhanced pedagogical experiences. These individuals hold various titles that include, but are not limited to, AT directors, instructional designers, and directors of eLearning. They are found in technology centers on campus and within various departments, including IT and the provostôs office. Regardless of the differences in titles and departmental affiliation, since these individuals identify themselves as belonging to the AT profession, we were interested in gathering information about how they perceive their own roles and responsibilities.

The subjects were a self-selecting sample, reaching a self-selecting sample to participate is a challenge because they are ñcoldò contacted and asked to complete a survey and return it (Mcmillan & Schumacher, 2010) All efforts were made to ensure that a significant number of individuals were contacted, The sample were contacted through organizations that cater to the AT profession, Educause Learning Technology Leadership Alumni distribution list (LTLAlum) and the Association for Educational Communications and Technology (AECT). LTLAlum has 375 people on their email distribution list and AECT has 2,200 members in good standing. Both organizations publish journals, provide professional development, and hold conferences. The principle researcher used email to contact the manager of the LTLAlum distribution list and the person responsible for research initiatives. Both responded by email agreeing to disseminate the survey. Copies of the memorandum of understanding to disseminate the survey by the organizations is found in Appendix A. After the primary researcher received approval from the

Pepperdine University Internal Review Board (Appendix B), the request for participation was sent to the two organizations that had agreed to disseminate the survey.

Instrumentation and Data Collection

Descriptive research design uses a data-gathering instrument to obtain numerical indices that correspond to characteristics of the subjects, a process that provides objectivity in measuring and describing phenomenon by use of numbers and statistics to explain, predict, or describe a situation (Johnson & Christensen, 2008; Mcmillan & Schumacher, 2010). These numerical values are then summarized and reported as results.

The research instrument describes the technique that is used to gather data about peopleôs behavior, opinions, and demographics (Mcmillan & Schumacher, 2010). For this study, data were collected with a survey of the type used frequently in education because it obtained accurate information for large numbers of people with a small sample. The instrument included the same questions for all participants from the sample target population of AT professionals selected by the investigator (Mcmillan & Schumacher, 2010). The research problem and survey were loosely based on the recommendations for further study that John Nworie laid out in his 2005 study on the roles and responsibilities of ATSS (Nworie, 2005). The principle researcher of this study framed those findings into survey questions that were distributed to current college and university AT professionals. For example Nworie identified *Leadership and Strategic Planning* as an emerging role for AT professionals. For this role, he noted that a responsibility would be: ñResearch future trends in technology and education and how best technology will serve the intuitionôs mission (Nworie, 2005, pp. 38-39).ò For this study, the principle researcher modified Nworieôs statement to fit the *Does Perform* ï *Should Perform* survey format with the statement reading: ñI research future trends in technology and education and best the technology will serve

the intuitionôs mission.ô Other questions were included to determine the size of the unit in which the AT professional worked, the reporting structures of the members of the unit, and its affiliates within the institution.

Validity. Validity is the extent to which inferences made on the basis of numerical scores are appropriate, meaningful, and useful (Mcmillan & Schumacher, 2010). Content validity was established using a panel of three experts. Each of the experts holds an Ed.D. and is knowledgeable about a different area of the AT field. A modified copy of the survey was created on the web-based survey tool ñNovi Survey.ò The panel members were asked to evaluate whether the survey questions adequately address the research questions. Majority rule methodology was applied to the recommendations of the panel. The panel was asked to complete the online survey within two weeks. A copy of the modified survey (Expert Review) is included in Appendix C.

Reliability. Instrument reliability refers to the consistency of measurement (Mcmillan & Schumacher, 2010). The Cronbachs Alpha test was used to establish reliability and internal consistency of the survey questions. The test was run on the *does* perform and *should* perform selections of questions 8 through 33. Cronbachs Alpha established that 93% of the variance in the composite score in internally consistent and reliable (Table 2).

Table 2
Cronbach's Alpha Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.932	.936	60

Data collection. After the survey was vetted by the experts, the questions were entered into the web-based survey tool ñNovi Survey.ò According to Mcmillan & Schumacher (2010), online surveys offer advantages, compared to other techniques, such as quick response, easy follow-up, and the ability to survey a large population. The survey was designed to be as short as possible to achieve the maximum response rate from the subjects. A copy of the survey can be found in Appendix D.

The survey was available online for 2 weeks. An initial invitation was sent by email to the members of the AT professional organizations, the Educause LTLAlum distribution list and AECT. The email included an explanation of the study, the measures taken to ensure the privacy of the participants, contact information for the researchers, and a link to the survey. A copy of the email invitation is included in Appendix E. After 10 days, a reminder email was sent via the same organizations. The email included the aforementioned information, a thank you to any individuals who had completed the survey, and a reminder that the survey was still available to those who had not participated in the survey and still wished to do so.

Consent. When the survey was accessed by the respondent, the first screen was a letter of informed consent (Appendix F). This letter explained the research and assured participants that all measures would be taken to assure confidentiality. The respondents were also assured that they could terminate their participation in the study at any time, for any reason, This screen explained that by clicking on the link to continue with the survey, the respondent consented to participate.

The survey. The survey instrument had seven multiple-choice and short-answer questions to ascertain current employment and background characteristics. These were followed by 30 statements describing different professional responsibilities. Participants were asked to respond

to these questions in two different ways. The first response reflected whether or not they do perform the task. The second response reported the respondentôs opinion whether or not he should perform the task. Both sets of responses were based on a Likert scale ranging from 1 to 5, with 1 representing ñneverò and 5 representing ñalways.ò

The last four statements of the survey were designed to ascertain the level of influence the respondents *do* have and believe they *should* have at their institutions. The recipients of the instrument were asked to respond to these questions in two different ways. The first response reflected whether or not they *agree* that they have influence. The second response is the respondentôs opinion as to whether or not they *should* have influence. Both sets of answers were again based on a Likert scale ranging from 1 to 5, with 1 representing ñagreeò and 5 representing ñdisagree.ò Table 3 shows examples of the survey questions.

Table 3
Sample Survey Questions

Please rate these questions to the following scale:
1 = Strongly disagree, 2 = Disagree, 3 = Neither agree nor disagree, 4 = Agree, 5 = Strongly agree
Please circle your choice in both columns for each item.

DOES PERFORM agree				disagree			SHOULD PERFORM agree			disagree		
(34)	1	2	3	4	5	I have the opportunity to express my perspective or make recommendations for a particular cause of action.	1	2	3	4	5	(64)
(35)	1	2	3	4	5	I believe my recommendations effect the decision making process at my institution.	1	2	3	4	5	(65)

Once the specified survey time window of 2 weeks had elapsed, all the survey data were transferred to an external hard drive and were available to the researcher solely for use with this

research. All contents of the hard drive will remain confidential and will be permanently erased 3 years after the data collection period ended.

Limitations. The strength of descriptive research design is also a weakness in that it only provides a snapshot of a specific period in time. The intent of this study was to capture a picture of the field as it currently exists. It is hoped that this study will be conducted several times in the future so that a more comprehensive description of the AT field can emerge and the influence of these professionals can be delineated and assessed as leaders in an important field that effectively integrates technology into teaching and learning in higher education.

A self-selecting sample also has limitations because the individuals are asked to participate by the researcher; they do not seek out participation. This research offered no tangible incentives, except for the knowledge that the participants are assisting in the ongoing pursuit of knowledge and the presumption that the results of this study will further their chosen field.

The disadvantages of online survey tools include limited sampling and the possibility that dissemination of the survey link will not provide a sufficient sample size or response rate (Mcmillan & Schumacher, 2010) to make the study significant. This was not the case, as a sufficient sample of 81 respondents participated in the study. Therefore, the study was closed after the approved 2-week study window had elapsed.

Another possible problem associated with this study could stem from the lack of standardization in position titles in this field. Institutions often have different terms and roles to describe the individuals who are performing AT functions. The researcher developed appropriate categorization schema to incorporate all the useful data in a meaningful way.

Variables and Data Analysis

Variables. The variables are the attributes that were studied. The variable of research question 1, ñWhat are the major areas of responsibilities of AT professionals?,ò is the major area of responsibility. Factor analysis was used to compute the variable.

The variable of research question 2, ñTo what extent do AT professionals believe they fulfill their perceived level of obligations across the areas of responsibilities determined in research question 1?,ò is the perceived level of fulfillment, as measured by the *does* and *should* perform responses. The method of analysis was frequency distribution, mean, and standard distribution.

The variable of research question 3, ñIs there a gap in performance across the areas of responsibilities?,ò is the gap in performance in the areas of responsibilities performed by AT professionals. Paired t-tests will be used to determine if there is a gap or difference between the level at which areas of performance ARE (Do) performed and SHOULD be performed.

The variable of research question 4, ñIs there a relationship between the magnitude of the gap in performance in obligations and the professional background and characteristics of the AT professionals?,ò is the magnitude of the gap in performance and the background and professional characteristics of AT professionals. The method of analysis was the professional background and characteristics of AT professionals as obtained from questions 3, 4, and 26ï 28. Analysis of variance (ANOVA) was used to determine the relationship.

The variables of research question 5, ñIs there a relationship between the magnitude of the gap in performance and the degree of perceived participation in decision making?,ò are the degree of perceived participation as measured through questions 23ï 25, 30, and 33ï 37 and the

magnitude of the gap in performance as measured in research question 3. ANOVA was used to determine the relationship.

The variables of research question 6, ñIs there a relationship between the magnitude of the gap in performance and the degree of perceived organizational effectiveness?,ò is the magnitude of the gap in performance as measured in research question 3 and the perceived organizational effectiveness as measured through questions 34ï 37. ANOVA was used to determine the relationship.

Data Analysis. The data was interpreted using the method of factor analysis. Factor analysis is an appropriate method of interpretation for this study because it is used when a study focusses on a population, in this case AT professionals, and the variables of interest are attributes of those people (Tucker & MacCallum, 1997). According to Tucker and MacCallum, ñThe central objective of factor analysis is focused on common factors to gain an understanding of their nature and the dynamics of their relationships to each other and the attributesò (Tucker & MacCallum, 1997, p. 13). There were two objectives of this study: first to identify the responsibilities and to measure the influence of AT professionals, and second to investigate whether or not there is a gap in performed responsibilities and influence and desired responsibilities and influence of AT professionals. Factor analysis reduced the data to a small set of summary variables and identified the relationships between measured variables.

Ethical Considerations

Research ethics are concerned with what is right or wrong from a moral perspective when engaging with study participants (Mcmillan & Schumacher, 2010). It is imperative that no harm, injury or discomfort come to any participant in a study. To minimize risk to the participants, this study was conducted in accordance with the guidelines set out by the Institutional Review Board

(IRB) of Pepperdine University as outlined below. The emphasis of this study was educational research and as such, was considered non-invasive to the participants.

The research subjects, drawn from professional organizations, were self-selecting and voluntarily completed the survey regarding their work environment, roles, and responsibilities. This study did not inflict personal or physical injury of any kind to the subjects. No coercion of any kind was employed to garner study participation. The web-based tool ñNovi Surveyò allowed for the creation of a consent form that participants digitally submitted before they began the survey.

When the participant accessed the survey for the first time, a letter explaining the goals of the study and the rights of the participant appeared. Participant rights included the assurance that all information the participant offered by way of completing the survey was accessed by only the principle researcher or supervising faculty member. No one else has access to the information provided by the participant. The survey included no identifying questions, such as name, address, and workplace. The respondent indicated agreement to participate by accessing the survey and completing the questions. The respondent was able to stop participating in the study at will by choosing not to complete or submit the survey.

After the survey closed, the data was downloaded to an external hard drive accessible only by the principle researcher and supervising faculty member. Only the principle researcher compiled and analyzed the individual responses. The researcher will retain the stored data on the external hard drive in her possession for three years. After three years, the data will be permanently deleted by the researcher. To further ensure anonymity, there were no consent forms outside of the survey and no link between the data and respondents. Any participant who wished to receive a copy of the data analysis was required to send a request for this information

to the principal researcher or the faculty member supervising the research. Confidentiality was assured since only the researcher has access to the data and any identifying information. These procedures were followed to minimize any possible risk to the participant.

Summary

This chapter restated problems facing professionals in the field of AT: Integration of technology into teaching and learning on college campuses requires a professional who understands both technology and pedagogy. The purpose of this study was to capture current data on the responsibilities and influence of the AT professional described.

The research followed a descriptive design. Descriptive research describes a phenomenon as it exists at a specific point in time, in this case the field of AT. A survey was used to garner information from AT professionals regarding their perceptions of their roles, responsibilities and leadership ability. Factor analysis was used to interpret the data and the relationships of the variables.

All measures were taken to ensure the privacy of the individuals participating in the research. The participant was required to consent to participation in the study. He did so by reading the posted introduction to the study and choosing to continue. No identifying information was collected. The data collected is only be available to the principle researcher and faculty supervisor. The survey was available for two weeks. After two weeks the data was removed from the web survey tool and kept on an external hard drive. The data will be permanently deleted after three years. If a participant is interested in a copy of the research he will need to contact the principle researcher or the faculty member overseeing the research. The data will be analyzed in Chapter 4 of this paper.

Chapter 4: Study Results

According to Privateer (1999), effective and contemporary colleges must have a strategically guided approach to technology that includes a strategic Academic Technology (AT) agenda and dedicated campus resources under the leadership of an AT officer. The dedicated AT professional needs to understand technological applications and educational goals and can communicate their knowledge to non-technical people such as faculty to improve education. (Nworie & Albright, 2008; Nworie & Haughton, 2008; Privateer, 1999). Further, in order for an AT strategy to be truly successful, this dedicated AT officer needs to be in an influential position on campus (Privateer, 1999).

The problem is that the AT field is broadly defined, making it difficult to categorize and characterize the roles and responsibilities that AT professionals currently perform or the obligations and responsibilities that they believe they should be performing. The purpose of this study was to discover the roles, responsibilities and obligations of AT professionals in higher education and to measure the perceived influence that they believe that they have on campus and the level of influence they believe they *should* have in institutional AT decision making and strategic planning.

The goals of the study were to create a snapshot of AT professionals in higher education as they self-report their current roles and responsibilities, what they think these should be, and if they think their views influence AT decision making at their institution. The survey asked the respondents to measure on a scale of 1-5 their current performance of a task, what they *do*, and what they think they *should* do, the study was designed to identify perceived gaps in the performance of tasks of AT professionals and gauge the perceived influence AT professionals

believe they have on college campuses. The results of the survey were analyzed using descriptive statistics techniques.

Restatement of Research Questions

The research questions answered were:

1. What are the major areas of responsibilities of AT professionals?
2. To what extent do AT professionals believe they fulfill their perceived level of obligations across the areas of responsibilities determined in Research Question 1?
3. Is there a gap in performance across the areas of responsibilities?
4. Is there a relationship between the magnitude of the gap in performance in obligations and the professional background and characteristics of the AT professionals?
5. To what extent do AT professionals believe that they participate in institutional AT decision making?
6. Is there a relationship between the magnitude of the gap in performance and the degree of perceived participation in decision making?

Study Results

The survey was conducted online. An email invitation requesting survey participants was sent to members of the Educause LTLAlum distribution list and the Association of Educational Communications and Technology. The survey was available to participants for 2 weeks, during which time 81 individuals began the survey and 71 completed the entire survey. The online survey contained 37 questions. The first 7 questions sought to ascertain respondentôs characteristics, such as their educational background. Questions, 8 to 33, each consisted of a statement accompanied by two Likert scales. Respondents were asked to indicate to what degree they *do* perform the statement on one scale and the degree to which they believe they *should*

perform the statement on the other. The last four questions, 34 to 37, asked the respondents to measure the degree to which they believed the statement to be true. Table 4 shows the research questions and their corresponding survey questions and statements.

Table 4
Research Questions and Corresponding Survey Questions

Respondent Characteristics	
Survey Statement	1. At what type of institution do you work? 2. What is your official title? 3. What is your highest level of education? 4. How would you describe your background? 5. Which institutional unit is your position primarily connected to? 6. How long have you been serving in your current position? 7. I am considered
RQ 1: What are the major areas of responsibilities of AT professionals?	
RQ 2: To what extent do AT professionals believe they fulfill their perceived level of obligations across the areas of responsibilities determined in Research Question 1?	
RQ 3: Is there a gap in performance across the areas of responsibilities?	
RQ 4: Is there a relationship between the magnitude of the gap in performance in obligations and the professional background and characteristics of the AT professionals?	
Survey Statement	8. I oversee the development and support of distance learning courses. 9. I provide instructional design support. 10. I research future trends in technology and education and how best the technology will serve the institutionôs mission. 11. I collaborate with campus stakeholders to establish policies and standards on instructional technology issues, hardware, software and their use. 12. I assess the impact of academic technology use in teaching. 13. I consult with faculty on curricular improvement. 14. I consult with faculty on instructional design. 15. I support faculty in new ways of teaching and learning. 16. I create online course materials for faculty. 17. I create vision and mission statements that match the instructional goals of my institution. 18. I participate in the design and standardization of technology classrooms to meet different teaching styles and faculty needs. I articulate academic technology objectives to upper management.

(continued)

Survey Statement	19. 20. I act as a liaison between upper management and faculty on issues surrounding instructional technology. 21. I plan for long term installation and upgrades of technology in classrooms. 22. I lead efforts to identify and evaluate next generation learning technologies. 23. I recommend the purchase and use of learning technologies. 24. I investigate and communicate issues relating to changes in instructional technology and faculty expectations to administrators. 25. I investigate and communicate issues relating to changes in instructional technology and student expectations to administrators. 26. I attend professional development or training workshops for existing technologies. 27. I attend professional development or training workshops for new technologies. 28. I attend professional development workshops in educational technology. 29. I manage a staff of Academic Technology professionals. 30. I influence strategic technology decisions. 31. I participate in academic technology strategic planning. 32. I teach education/ academic technology courses at my institution. 33. I participate in meetings that impact learning technology at my institution.
RQ 5: To what extent do AT professionals believe that they participate in institutional AT decision making?	
RQ 6: Is there a relationship between the magnitude of the gap in performance and the degree of perceived participation in decision making?	
Survey Statement	34. I have the opportunity to express my perspective or make recommendations for a particular cause of action. 35. I believe my recommendations effect the decision making process at my institution. 36. I believe learning technologies are effectively used at my institution. 37. In my opinion, my superiors believe that learning technologies are effectively used at my institution.

Respondent Characteristics

The respondents were asked to respond to seven descriptive questions aimed at gathering professional characteristics. The first question the respondents were asked was to identify the type of higher education institution that they are currently employed. An overwhelming majority of 84% are employed at a four year institution (Figure 2).

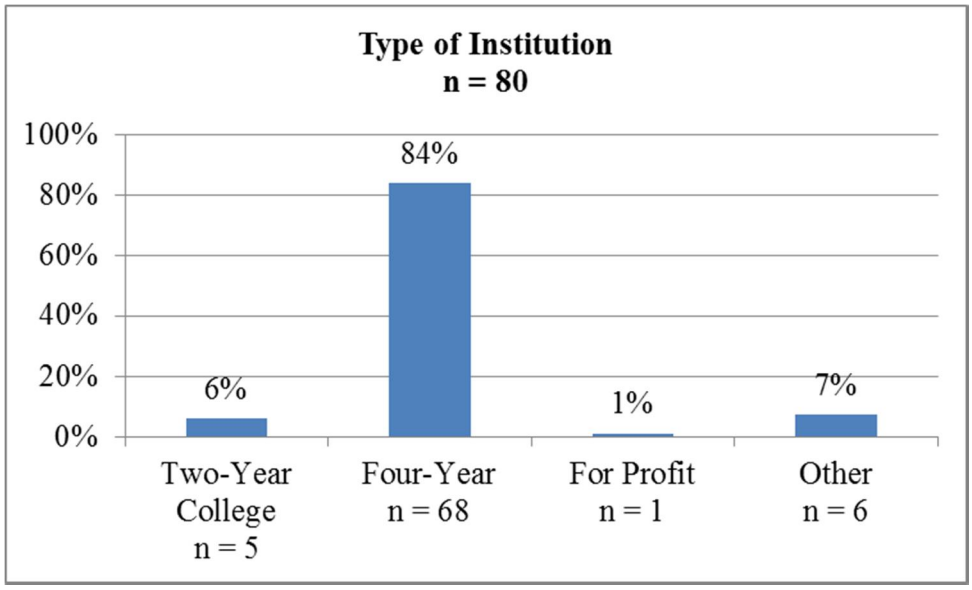

Figure 2. Respondent institution

Survey question number 2 asked respondents about their position title. They were asked to choose from a list offering ñAcademic Technology Director,ò ñInstructional Designer,ò ñeLearning Director,ò and ñOther.ò Results show that the majority of the titles did not fit within the given choices on the survey (Figure 3) with 65% of the respondents choosing the option of ñOther.ò When the respondent chose the option of ñOtherò they were asked to write in the title. After studying the text responses (Figure 4) a clearer picture is painted. There are no overwhelming standard choices for a position title. The small majority, 39%, have the term ñdirectorò in their title: 17% ñAT Director; ò 3% ñeLearning Director;ò and 19% ñOther Director.ò Faculty members comprise 18% of the AT positions.

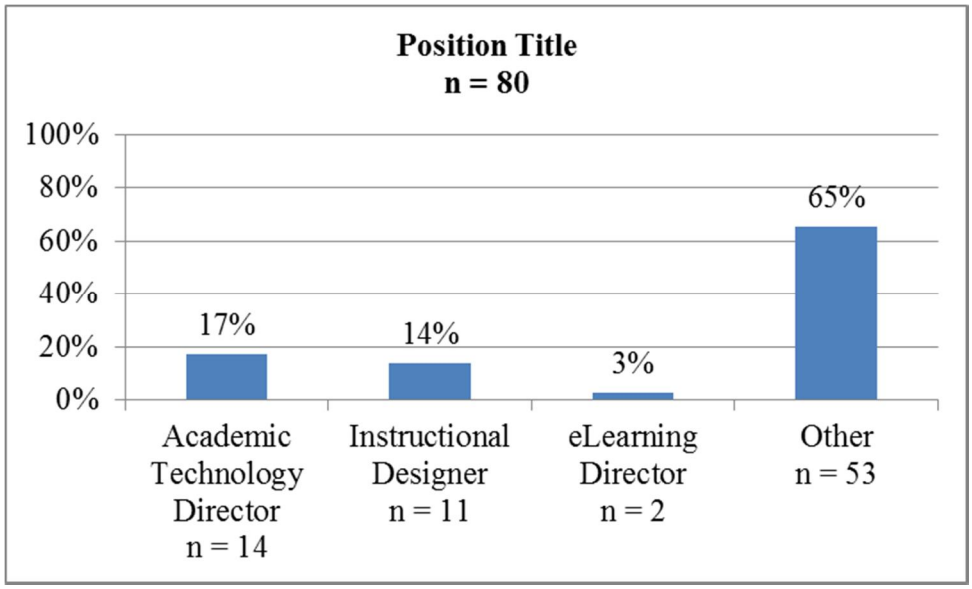

Figure 3. Respondent position title

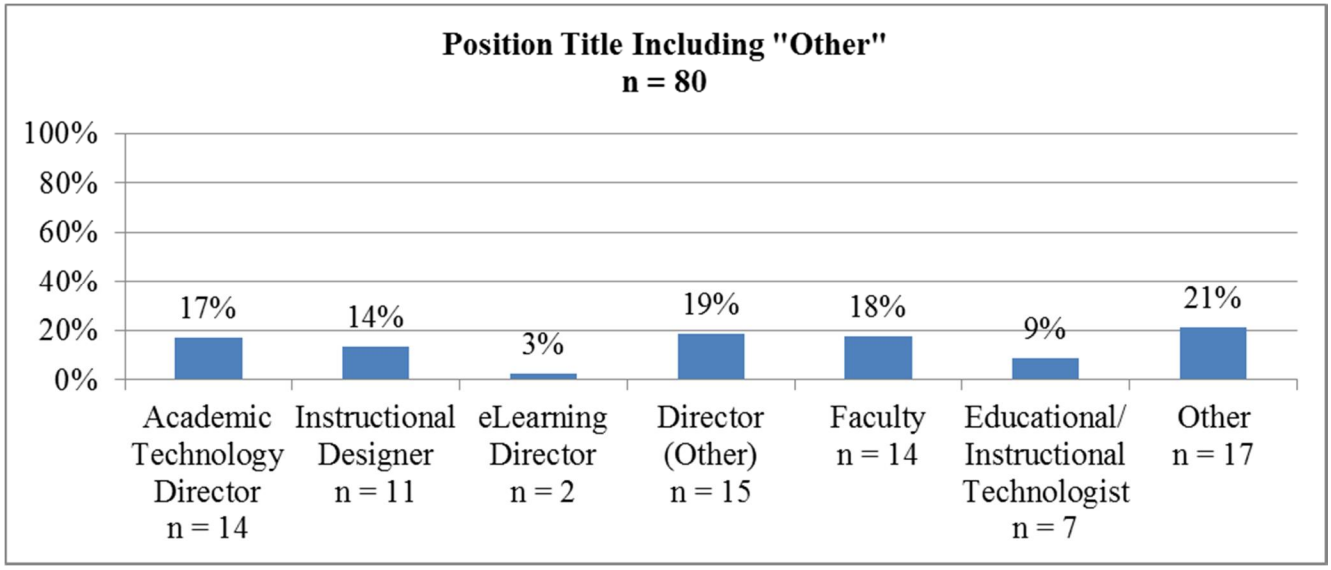

Figure 4. Respondent position title including "other"

Question 3 asked the respondents to choose their highest level of education. The majority of respondents have a higher degree with 56% holding a Masterôs Degree and 38% with a Doctorate (Figure 5).

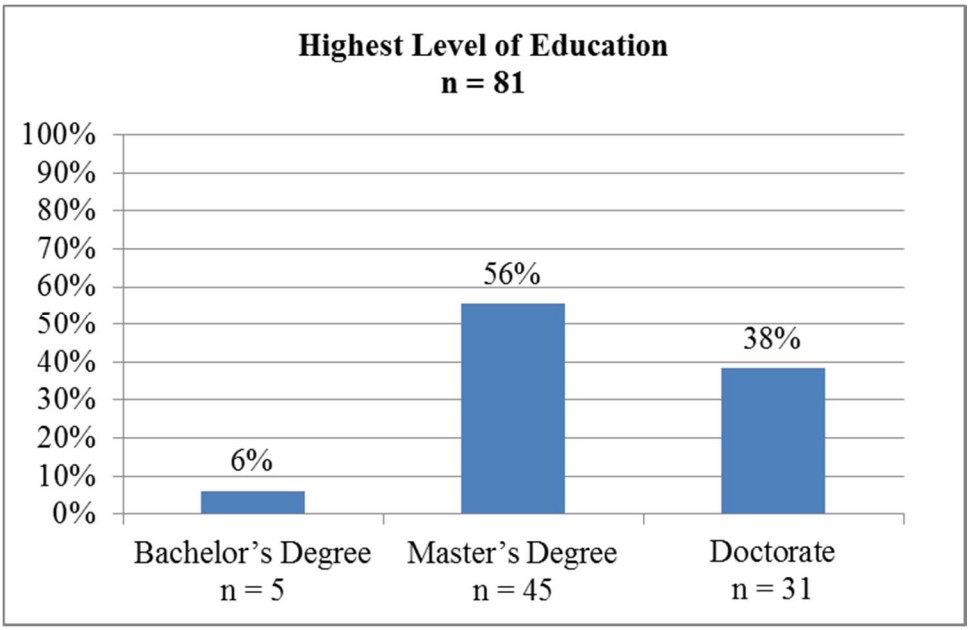

Figure 5. Respondent highest level of education

Survey question 4 asked the respondents to describe their professional background. They were given the option to choose ñEducational (Teaching),ò Technical (Computer/IT),ò ñBusiness,ò and ñOther.ò Fifty-six percent chose ñEducational (Teaching)ò while 20% chose ñTechnical (Computer\IT)ò and ñOther.ò The ñOtherò option allowed respondents to write in their background. Examination of these entries (Figure 6) show that 15% had a combination of disciplines in their background, with a majority, 70%, having a some sort of ñEducationalò background.

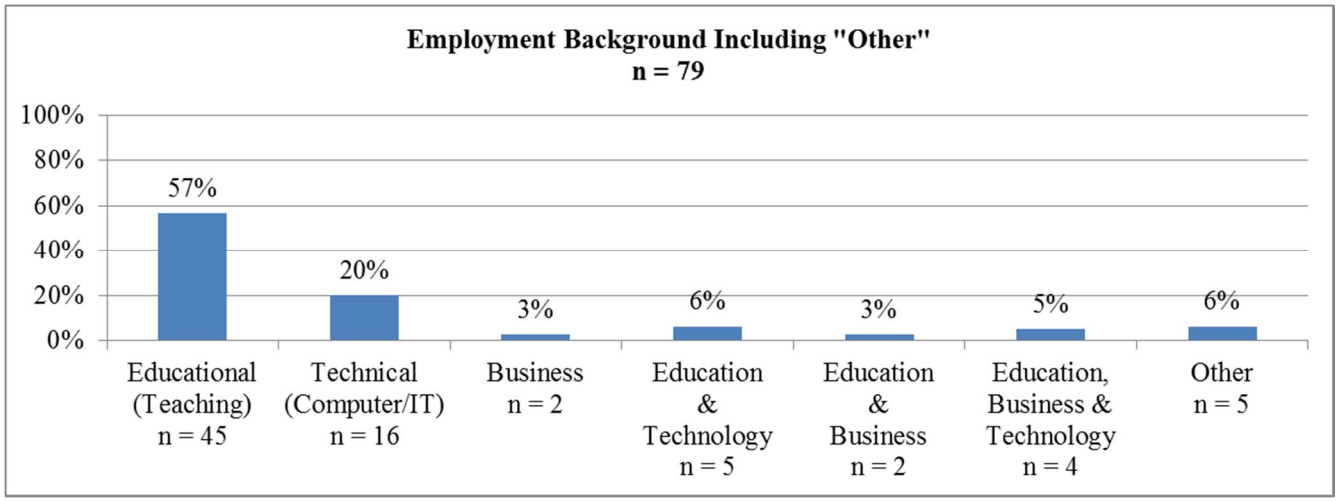

Figure 6. Employment background ñotherò

Survey question number 5 was asked in order to see which institutional unit the respondentôs position was connected. Half of the respondents, 50%, are connected with a technology unit, IT or Media Center at their institutions. Only 23% have a position that is connected to the academic executive at their institution (Figure 7).

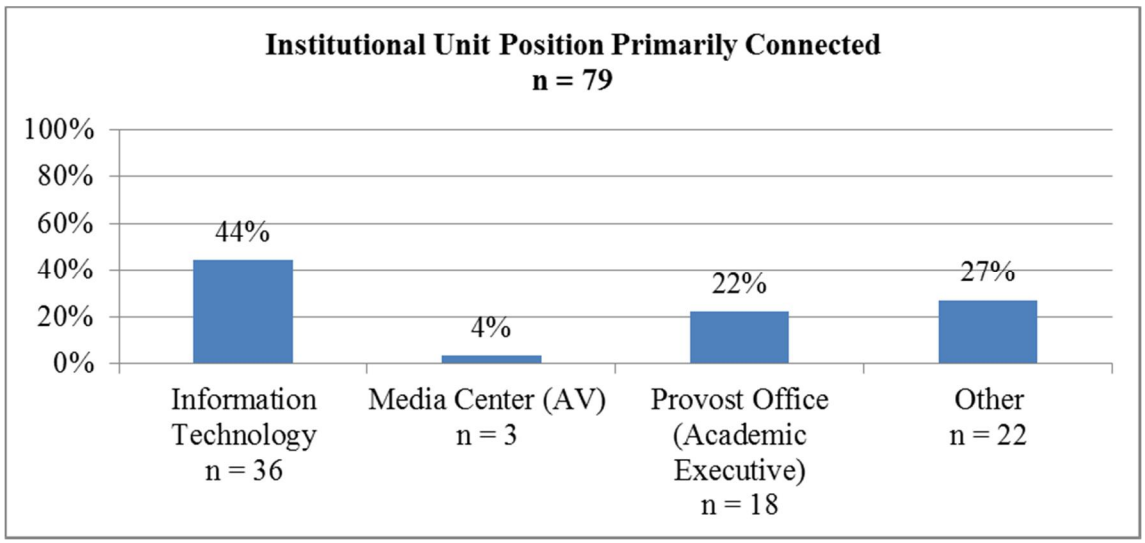

Figure 7. Institutional unit respondent is connected

Survey question 6 asked the respondents to choose the number of years that they have been in their AT position at their institution. The majority, 59%, have been in their position more than 4 years with 31% over 7 years (Figure 8).

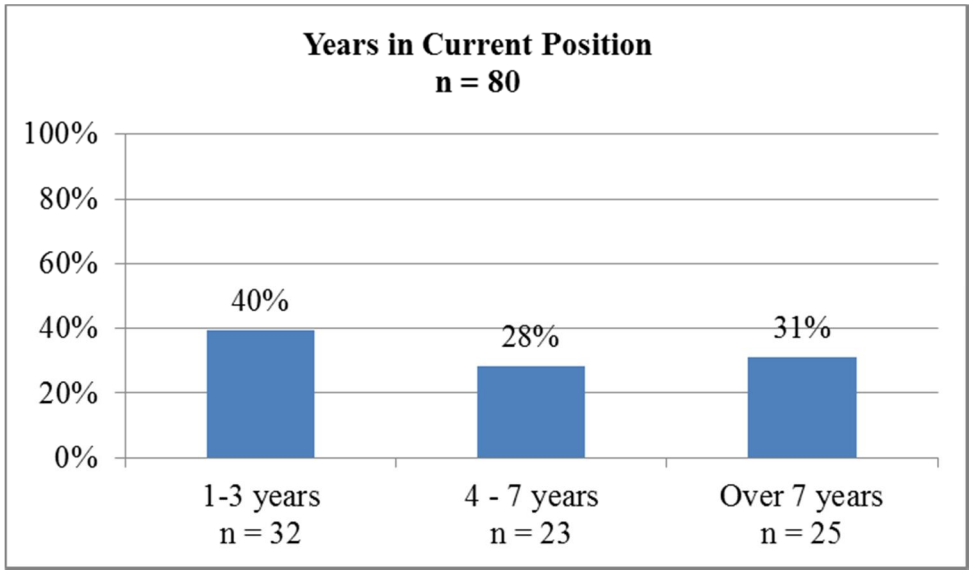

Figure 8. Years respondent is in current position

The final characteristic, survey question 7, was to classify the type of position that the AT professional holds on campus (Figure 9). The respondents were asked to choose from a list that included ñFaculty,ò ñStaff ï IT,ò ñStaffð Other,ò and ñOther.ò A clear majority, 67%, are considered ñstaffò positions, the majority being in IT and 25% of the respondents are faculty members.

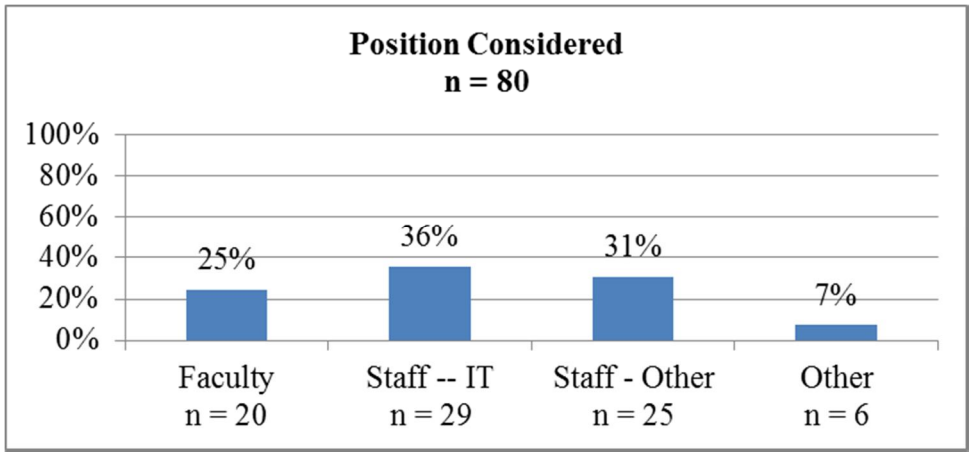

Figure 9. Respondent's position is considered ...

Respondent Profile

The majority of the respondents work at a 4-year baccalaureate college and hold a masterôs degree. AT professionals come from different backgrounds with the majority hailing from the world of education. There is no clear official title of the AT positions, though many of the titles include the term ñdirector.ò Approximately half of the respondents are considered staff and a quarter are faculty. The majority of the AT professionals surveyed are connected to the IT unit of their institution with less than a quarter of these individuals affiliated with the academic executive branch or Provost Office. Additional respondent characteristics can be found in Appendix G.

Research Question Data

Survey questions 8 ï 33 were asked to discover the responsibilities and obligations of the AT professionals and whether or not they believe that there is a gap in performance of responsibilities as found in research questions 1 ï 6.

Research Question 1: Responsibilities

Research question 1, ñWhat are the major areas of responsibilities of AT professionals?,ò required reducing many survey responses to smaller number of factors in the following process. The responses were collected and statistics software was used to perform a factor analysis. Factor analysis is used to reduce data and identify a small number of factors that explain most of the variance within a set of observed variables (IBM, n.d). The factor analysis was performed on survey statements 8 ï 33 and used to answer research questions 1 ï 4. The final four statements, 34 ï 37, in the survey were not included in the analysis as they are focused on the respondentôs beliefs and have been calculated separately to answer research questions 5 and 6. The factor analysis was performed on survey statements 8 ï 33 and used to answer research questions 1 ï 4. The final four statements, 34 ï 37, in the survey were not included in the analysis as they are focused on the respondentôs beliefs and have been calculated separately to answer research questions 5 and 6.

The five factors that were obtained collectively account for 96.91% of variation in the data. The list of variables was collectively exhaustive and mutually exclusive. The factor analysis was performed on survey statements 8 ï 33 and used to answer research questions 1 ï 4. The final four statements, 34 ï 37, in the survey were not included in the analysis as they are focused on the respondentôs beliefs and have been calculated separately to answer research questions 5 and 6. The Factor Analysis tables are found in Appendix H.

Once the variables in each factor were determined, they were examined for commonalities. The factors achieved were studied by the principal researcher and another doctoral student for agreement on labels. The factor analysis yielded the following categories of responsibilities:

1. Strategic Planning
2. Instructional Design
3. Ongoing Personal Professional Development
4. Academic Technology Management
5. Research and Assessment

Mutual exclusivity and collectively exhaustive. Mutual exclusivity and collectively exhaustive is a statistical term meaning to separate lists into subcategories. For this study, the categories that were determined through the factor analysis were deemed to be mutually exclusive and collectively exhausted and account for 96.91% of variation in the data. This means that the categories are inclusive and encompass all the possibilities. The factors include both the ñdoò survey statements 8 ï 33 and the ñshouldò survey statements 34 ï 66 . Each survey statement is represented by only one of the factors or category. For example, as Table 5 illustrates, the factor ñStrategic Planningò is comprised of the survey statements, 11, 19, 20, etc.

Table 5
Area of Responsibility and the Related Survey Statements

Responsibility	Number and Key Word of the Survey Statement
Strategic Planning	11 (Do-Policy), 19 (Do-Articulate), 20 (Do-Liaison) , 23 (Do-Application) , 29 (Do-Manage) , 30 (Do-Strategy), 31 (Do-Strategy), 41 (Should-Policy) , 49 (Should-Articulate) , 50 (Should-Liaison) , 53 (Should-Application), 59 (Should-Manage), 60 (Should-Strategy), 61 (Should-Strategy)
Instructional Design	8 (Do-Development), 9 (Do-Support), 13 (Do-Consult), 14 (Do-Consult), 16 (Do-Create), 38 (Should-Development), 39 (Should-Support), 43 (Should-Consult), 44 (Should-Consult), 46 (Should-Create)
Ongoing Personal Professional Development	26 (Do-Professional Development), 27 (Do-Professional Development), 28 (Do-Professional Development), 56 (Should-Professional Development), 57 (Should-Professional Development), 58 (Do-Professional Development)
Academic Technology Management	18 (Do-Design), 21 (Do-Plan), 48 (Should-Design), 51 (Should-Plan)
Research and Assessment	12 (Do-Assess), 24 (Do-Investigate), 25 (Do-Investigate), 42 (Should-Assess), 54 (Should-Investigate), 55 (Should-Investigate)
Statistically Insignificant Statements	10 (Do-Research), 15 (Do-Support),17 (Do-Vision), 22 (Do-Evaluate), 32 (Do-Teach), 33 (Do-Participate), 40 (Should-Research), 45 (Do-Support), 47 (Should-Vision), 52 (Should-Evaluate), 62 (Should-Teach), 63 (Should-Participate)

Further Analysis of Major Areas of Responsibilities

Strategic Planning. ñStrategic Planningò is the first factor because in the factor analysis results this area had the largest amount of variables associated with it. The factor analysis was deduced from the variables of the *do* and *should* statements found in Table 6. Table 6 also shows the key word for each statement. These key words and the topic of the statements were bundled into the overall category of ñStrategic Planning.ò A Cronbachôs Alpha reliability test concluded that 89% of variance in composite score is considered internally consistent and reliable. The factor loadings report for Factor 1: Strategic Planning is found in Appendix H21-24.

Table 6
Factor 1: Strategic Planning, Do-Should Statements

Survey Question Number	Key Word	Statement
11, 41	Policy	I collaborate with campus stakeholders to establish policies and standards on instructional technology issues, hardware, software and their use.
19, 49	Articulate	I articulate academic technology objectives to upper management.
20, 50	Liaison	I act as a liaison between upper management and faculty on issues surrounding instructional technology.
23, 53	Application	I recommend the purchase and use of learning technologies.
29, 59	Manage	I manage a staff of Academic Technology professionals.
30, 60	Strategy	I influence strategic technology decisions.
31, 61	Strategy	I participate in academic technology strategic planning.

Instructional Design. The next set of statements (Table 7) were bundled into the second most common factor, ñInstructional Design.ò The variables were deduced from the *do* and *should* statements by factor analysis and the reliability test Cranachôs Alpha was performed and it was concluded that 83% of variance in composite score is considered internally consistent and

reliable. The factor loadings report for Factor 2: Instructional Design is found in Appendix H21-24.

Table 7
Factor 2: Instructional Design Do-Should Statements

Survey Question Number	Key Word	Statement
8, 38	Oversee	I oversee the development and support of distance learning courses.
9, 39	Support	I provide instructional design support.
13, 43	Consult	I consult with faculty on curricular improvement.
14, 44	Consult	I consult with faculty on instructional design.
16, 46	Create	I create online course materials for faculty.

Ongoing Personal Professional Development. The third most common factor resulting from the factor analysis is bundled into the grouping of ñOngoing Personal Professional Development.ò This was deduced from the variables of the *do* and *should* statements found in Table 8. The Cronbachôs Alpha reliability test concluded that 76% of variance in composite score is considered internally consistent and reliable. The factor loadings report for Factor 3: ñOngoing Personal Professional Developmentò is found in Appendix H21-24.

Table 8
Factor 3: Professional Development Do-Should Statements

Survey Question Number	Key Word	Statement
26, 56	Professional Development	I attend professional development or training workshops for existing technologies.
27, 57	Professional Development	I attend professional development or training workshops for new technologies.
28, 58	Professional Development	I attend professional development workshops in educational technology.

Academic Technology Management. The fourth common factor of the factor analysis is the category ñAcademic Technology Management.ò This category was deduced from the study

of the variables of the *do* and *should* statements found in Table 9. The Cronbach's Alpha reliability test concluded that 88% of variance in composite score is considered internally consistent and reliable. The factor loadings report for Factor 4 ñAT Managementò is found in Appendix H21-24.

Table 9
Factor 4: Academic Technology Management Do-Should Statements

Survey Question Number	Key Word	Statement
18, 48	Design	I participate in the design and standardization of technology classrooms to meet different teaching styles and faculty needs.
21, 51	Plan	I plan for long term installation and upgrades of technology in classrooms.

Research and Assessment. The fifth and final common factor of the analysis is grouped under the title ñResearch and Assessment.ò It was deduced from the variables of the *do* and *should* statements found in Table 10 and the Cronbachôs alpha reliability test concluded that 77% of variance in composite score is considered internally consistent and reliable. The factor loadings report for Factor 5: ñResearch and Assessmentò is found in Appendix H21-24.

Table 10
Factor 5: Do-Should Statements

Survey Question Number	Key Word	Statement
12, 42	Assess	I assess the impact of academic technology use in teaching.
24, 54	Investigate	I investigate and communicate issues relating to changes in instructional technology and faculty expectations to administrators.
25, 55	Investigate	I investigate and communicate issues relating to changes in instructional technology and student expectations to administrators.

Answer to Research Question 1

A factor analysis test was done on the ñdoò survey statements 8-33 and the ñshouldò survey statement 34 ï 66. The factor loadings were set at 5 which gave us 5 categories of responsibilities. These five categories represent 97% of the variation of the data. The five major areas of responsibilities of AT professionals are, in order of commonality:

1. Strategic Planning
2. Instructional Design
3. Ongoing Personal Professional Development
4. Academic Technology Management
5. Research and Assessment

These categories are collectively exhaustive and mutually exclusive which means that each of the variables in the survey statements are included in one of the five areas of responsibility.

Research Question 2: Fulfillment of Responsibilities

Research question number 2 asks, ñTo what extent do AT professionals believe they fulfill their perceived level of obligations across the areas of responsibilities previously determined in Research Question 1?ò These responsibilities fall into the following categories: *Strategic Planning*; *Instructional Design*; *Professional Development*; *Academic Technology Management*; and *Research and Assessment*.

To determine whether the AT professionals believe that they fulfill the areas of responsibilities, the average score of the responses was calculated and the mean, mode, median, and standard deviation was determined, as shown in Tables 11 and 12. The standard deviation shows how much variation exists from the expected value, or mean. The results show that the

categories with the greatest standard deviation are *Ongoing Personal Professional Development* and *Academic Technology Management*.

The scale of responses was 1-Never, 2-Rarely, 3-Sometimes, 4-Usually and 5-Always. Therefore, the higher the Mean the more often the AT professional performs the specific responsibility or obligation. AT professionals report that *Professional Development* was the most often performed responsibility and obligation with a mean of 4.44. *AT Management* was the least performed responsibility, rarely performed, with a mean of 2.60. The responsibilities of *Strategic Planning* and *Research and Assessment* are clustered together in frequency with an average of 3.30 and 3.24. While *Instructional Design* is ñsometimesò performed with an average of 3.

Table 11
Responsibilities that AT professionals "Do"

	Mean	Mode	Median	Standard Deviation
Strategic Planning	3.30	3	3.43	1.10
Instructional Design	3	2.80	2.80	1.03
Ongoing Personal Professional Development	4.44	5	5	0.77
Academic Technology Management	2.60	1	2	1.39
Research and Assessment	3.24	-	3.33	1.03

Similarly, with the ñShouldò statements, the higher the mean the more frequent AT Professionals believe that they should be performing the specific responsibility or obligation. Ongoing Personal Professional Development is high on the list of responsibilities with an average of 4.60. AT Professionals believe that they should be doing professionals development a bit more than they are currently doing. *Research and Assessment* follows with an average of 3.95 which means that they believe they should be involved more frequently in this area than they currently are performing.

Overall AT professionals also feel that they should be performing more in the areas of responsibilities and obligations than they are currently performing.

Table 12
Responsibilities that AT professionals believe they "Should" fulfill

	Mean	Mode	Median	Standard Deviation
Strategic Planning	3.84	4	4	1.02
Instructional Design	3.47	2.80	3.40	0.92
Ongoing Personal Professional Development	4.60	5	5	0.63
Academic Technology Management	3.33	4	3.50	1.26
Research and Assessment	3.95	5	4	0.93

Answer to Research Question 2

The mean was calculated from the results of research question number 1: ñWhat are the major areas of responsibilities of AT professionals?ò was calculated to answer research question number 2: ñTo what extent do AT professionals believe they fulfill their perceived level of obligations across the areas of responsibilities determined in Research Question 1?ò The respondents believe that they should be performing all of the responsibilities more than they currently are with the biggest difference *in Ongoing Personal Professional Development* and *Academic Technology Management*.

Research Question 3: Performance Gap

Research question number 3 asks: ñIs there a gap in performance across the areas of responsibilities?ò Performance gap is a concept that identifies the gap in employee performance of a task and the optimal performance of a task by the employees. Institutions use performance gap studies to measure the extent to which they have achieved their goals. This survey tool has measured the performance gap of AT professionals by looking at their actual performance of the task (ñDoò) and their perceived optimal performance of the task (ñShouldò). Understanding this gap will enable an institution to create an AT strategic plan to attain its goals. As Figure 9

illustrates there is a significant gap in performance of all tasks with the exception of Ongoing Personal Professional Development.

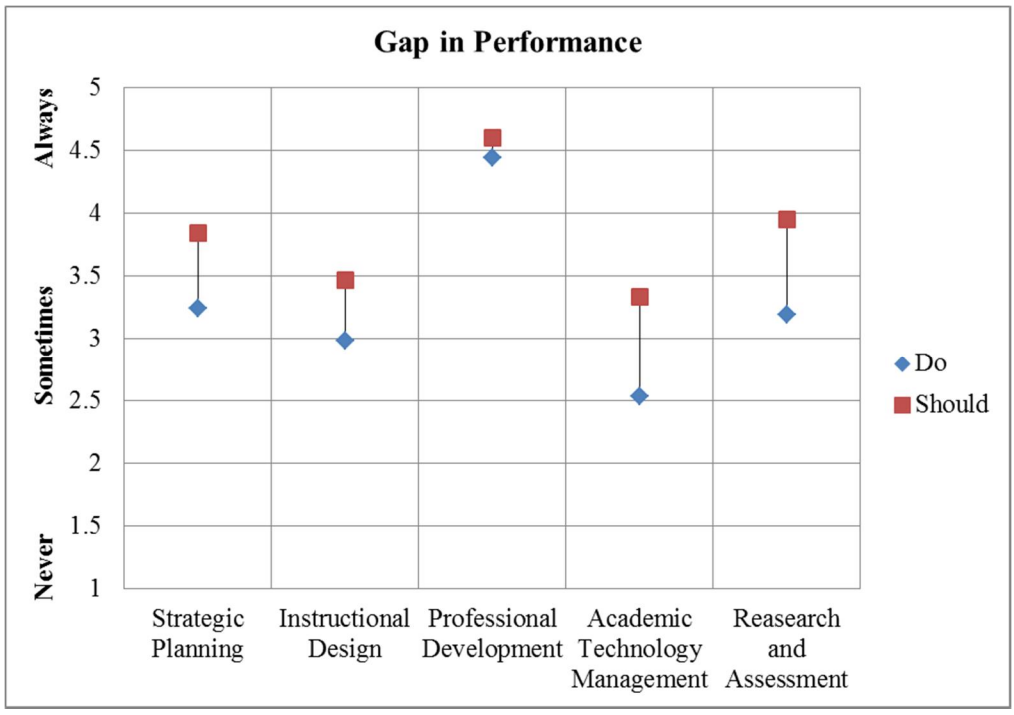

Figure 10. Gap in performance of areas of responsibility

To receive these results the *do* and *should* answers were compared using a paired t-test at the 0.001 level of significance to determine if there is a gap or difference between the level at which areas of performance ARE (Do) performed and SHOULD be performed. To determine the gap in performance, the *should* score was subtracted from the *do* score. Where the result is negative, the respondents believe that they should be doing more of that responsibility than they are currently. As Table 13 illustrates there is a significant gap in performance of all the responsibilities and obligations that AT professionals perform.

Table 13
Comparison of "Do" and "Should" responses

	Do	Should	Gap (ñDoò ï ñShouldò)	p-value
Strategic Planning	3.24 (n = 69)	3.84 (n = 69)	-0.59	0.00000*
Instructional Design	2.98 (n = 70)	3.47 (n = 70)	-0.50	0.00000*
Ongoing Personal Professional Development	4.44 (n = 68)	4.60 (n = 68)	-0.16	0.00091*
Academic Technology Management	2.53 (n = 68)	3.33 (n = 68)	-0.80	0.00000*
Research and Assessment	3.19 (n = 69)	3.95 (n = 69)	-0.76	0.00000*

* Significant at the 0.001 level

There is a statistically significant gap in do and should reports of performing Strategic Planning. Respondents reported that they are underperforming these responsibilities less frequently (*M* = 3.24) then the frequency at which they believe they should perform these tasks (*M* = 3.84).

The gap for performance of Instructional Design responsibilities is significant with the respondents reporting that they perform these tasks less frequently (*M* = 2.98) then they should be performing these tasks (*M* = 3.47) for a gap of -0.50.

The least significant gap (-0.16) in performance is in the area of Ongoing Personal Professional Development. The respondentôs report that they perform this obligation less frequently (*M* = 4.44) then they should (*M* = 4.60).

The greatest gaps are in the areas of Academic Technology Management (-0.80) and Research and Assessment (-0.76) where the respondentôs report that they are underperforming these responsibilities at a greater frequency at which they believe that they should perform the tasks.

Answer to Research Question 3

With p-values under the 0.001 level, there are statistically significant gaps in the performance of AT responsibilities. That is, the AT professionals surveyed believe that they are under-performing each of their responsibilities and obligations. The under-performances of ñAcademic Technology Managementò and ñResearch and Assessment ñ are more frequent than the underperformance of ñStrategic Planningò and ñInstructional Design,ò while ñOngoing Personal Professional Developmentò has the smallest under-performance.

Research Question 4: Magnitude of Performance Gap and Respondent Characteristics

Research question number 4 asks, ñIs there a relationship between the magnitude of the gap in performance in obligations and the professional background and characteristics of AT professionals?ò The performance in obligation means the frequency in which the AT professional does a responsibility, such as ñStrategic Planningò or ñInstructional Design.ò

To address this research question, ANOVA was used, with the magnitude of the gap in performance of obligations for each factor, area of responsibility, as the dependent variable and background and characteristics of the respondents as the independent variable. When p-values were less than 0.05, signifying statistically significant differences, Fishers Least Significant Difference (LSD) post-hoc test was used to identify those differences between the means.

To determine if there was a relationship between the magnitude of the gap in performance in obligations and the professional background and characteristics of an AT professional, the averages of the *do* score items and *should* score items were calculated. The *should* score average was then subtracted from the *do* score average to determine if there was a gap in performance and obligations. If the results showed that the respondents were ñover-performing,ò they felt that they were *doing* more in the specific area than they believed they

should be doing. If the results produced showed that the respondents were ñunder-performing,ò then they felt that there were *doing* less than they thought they *should* be doing. If there was a gap in performance Fishers LSD identified those differences and the results reported below.

Strategic planning performance gap. *Is there a relationship between the magnitude of the gap in performance in Strategic Planning responsibilities and obligations based on respondent characteristics*?

Analysis of variance was conducted. The gap in performance of ñStrategic Planningò responsibilities were the dependent variable and the professional background and characteristics of the respondent was the independent variable. This analysis resulted in statistically significant differences so a Fisherôs LSD test was applied.

The Academic Technology Professionals (ATPôs) who responded to the study reported that there is no statistically significant difference in the level of obligation and responsibility of ñStrategic Planningò based on the *type of employment institution* (Table I25), *level of education* (Table I27), *employment background* (Table I28), *years in current position* (Table I30) and what they *are considered* (Table I31) at their institution.

The ATPôs responses do show a statistically significant difference based on their *official title* (Table I26). A Fisherôs LSD test was performed to identify the differences (Table 14). Those with an official title that was not specified and chose ñotherò reported the greatest underperformance of ñStrategic Planningò responsibilities while ñeLearning Directorsò over perform these responsibilities to a greater extent than the those with other official titles.

Table 14
Strategic Planning Gap: Official Title Fisher's LSD

Characteristic	p-level*	Mean	Performance of Obligation and Responsibility
Official Title	0.002013 *		Statistically Significant
Academic Technology Director (n = 14)		-0.15	Those with an official title of Other and AT Director reported they underperform ñStrategic Planningò obligations and responsibilities while eLearning Directors and Instructional Designers feel that they over perform in this area.
eLearning Director (n = 2)		2.38	
Instructional Designer (n = 11)		1.4	
Other (n = 51)		-0.36	

* Significant at least the 0.05 level

The ATPôs responses also show a statistically significant difference based on the *institutional unit* that they are connected (Table I29). A Fisherôs LSD test was performed and it was discovered that all of the ATPôs feel that they are underperforming in the area of ñStrategic Planning.ò Those who are connected to the *Media Center* reported the largest underperformance in this area, while those connected to *IT* reported the least underperformance. Those ATPôs connected to the *Academic Executive* and *Other*, although not too different from each other, reported a larger degree of underperformance than those connected to *IT*, but smaller degree of underperformance than those connected to the *Media Center* (Table 15).

Table 15
Strategic Planning Gap Unit Connected To…. Fisher's LSD

Characteristic	p-level*	Mean	Performance of Obligation and Responsibility
Unit connected to	0.04428*		Statistically Significant
Media Center (AV) (n = 3)		-1.54	Those connected to the Media Center reported the largest underperformance in Strategic Planning activities. Those connected to IT reported the least underperformance.
Information Technology (n = 33)		-0.01	
Other (n = 22)		-0.58	
Academic Executive (Provost Office) (n = 14)		-0.66	

* Significant at least the 0.05 level

Instructional design performance gap. *Is there a relationship between the magnitude of the gap in performance in Instructional Design* responsibilities *and obligations based on the characteristics of the respondent's*?

Analysis of variance was conducted. The magnitude of the gap in performance ñInstructional Designò responsibilities was the dependent variable and the professional background and characteristics of the respondent was the independent variable. The ANOVA analysis produced statistically significant differences therefore, Fisherôs LSD was applied. The *type of college* (Table I32) employing the respondent, the respondentôs *academic degree level* (Table I34), *employment background* (Table I35), relationship with a specific *institutional unit* (Table I36) , *years in current position* (Table I37) and what the position is *considered* (Table I38) had p-values greater than the 0.05 level; it was concluded that these characteristics have no statistically significant influence in the perceived performance in Instructional Designò obligations.

The *official title* of the respondent had a p-value of 0.048, indicating that there were statistically significant differences in the perceived performance ñInstructional Designò obligations based on their *official title* (Table I33) therefore a Fisherôs LSD test was performed (Table 16). Those with the title of *Instructional Designer* reported that they are over-performing in the area of ñInstructional Designò obligations and responsibilities. The respondents whose titles are *AT Director*, *eLearning Director* and *Other* reported that they are under-performing in Instructional Design responsibilities and obligations.

Table 16
Instructional Design responsibilities gap Fisher's LSD

Characteristic	p-level*	Mean	Performance of Obligation and Responsibility
Official Title	0.048*		Statistically Significant
Academic Technology Director (n = 14)		-0.4	Those with an official title of Instructional Designer reported they over perform ñInstructional Designò obligations and responsibilities while AT Directors, eLearning Directors and other feel that they underperform these responsibilities.
eLearning Director (n = 2)		-0.2	
Instructional Designer (n = 10)		0.52	
Other (n = 46)		-0.53	

* Significant at least the 0.05 level

Ongoing personal professional development gap. *Is there a relationship between the magnitude of the gap in participation in Ongoing Personal Professional Development* activities *based on the characteristics of the respondent's*?

Analysis of variance was conducted. The magnitude of the gap in participation in ñOngoing Personal Professional Developmentò was the dependent variable and the professional background and characteristics of the respondents was the independent variable. It was found that statistically significant differences existed and a Fisherôs LSD test was applied to measure those differences.

The *type of college employing* the respondent (Table I39), the respondentôs *academic degree level* (Table I41), *employment background* (Table I42), relationship with a specific *institutional unit* (Table I43) and *years in current position* (Table I44) and what the position is *considered* (Table I45) had p-values greater than the 0.05 level; it was concluded that these characteristics have no statistically significant influence in the perceived participation in ñOngoing Personal Professional Developmentò activities.

With a p-value of 0.013919, indicating that there were statistically significant differences in the participation in ñOngoing Personal Professional Developmentò activities based on their *official title* (Table I40). A Fisherôs LSD test was performed to identify the differences that exist. Those with the titles of *Other* reported that they under participate in this area. Those with the titles of *Academic Technology Director*, *eLearning Director* and *Instructional Designer* reported that they over participate in ñOngoing Personal Professional Developmentò activities with the largest gap among *eLeraning Directors* (Table 17).

Table 17
Ongoing Personal Professional Development Gap Official Title Fisher's LSD

Characteristic	p-level*	Mean	Performance of Obligation and Responsibility
Official Title	0.013919*		Statistically Significant
Academic Technology Director (n = 14)		0.24	Those with an official title of eLearning Director, Instructional Designer and AT Director reported they over participate in ñOngoing Personal Professional Developmentò while those respondents with a title of Other feel that they under participate in these activities.
eLearning Director (n = 2)		4.44	
Instructional Designer (n = 10)		0.87	
Other (n = 46)		-0.21	

* Significant at least the 0.05 level

Academic technology management gap. *Is there a relationship between the magnitude of the gap in Academic Technology Management and the background characteristics of the respondent?*

The magnitude of the gap in participation in ñAcademic Technology Managementò was the dependent variable and the professional background and characteristics of the respondents was the independent variable. Analysis of variance was conducted and no significantly significant differences exist based on the *type of college employing* the respondent (Table I46),

the respondentôs *academic degree level* (Table I48), *employment background* (Table I49), relationship with a specific *institutional unit* (Table I50) and *years in current position* (Table I51) and what the position is *considered* (Table I52) .

With a p-value significant at 0.05, it was shown that the *official title* (Table I47) of the ATP was shown to have a significance in the performance of ñAcademic Technology Managementò responsibilities and tasks. A Fisherôs LSD test was performed to identify these differences.

The greatest over performance in the area of ñAcademic Technology Managementò was seen by those ATPôs with the official title of eLearning Director. Those whose official titles fall into the *other* category feel that they underperform in this area (Table 18).

Table 18
Gap 4 Academic Technology Management Fisher's LSD

Characteristic	p-level*	Mean	Performance of Obligation and Responsibility
Official Title	0.0006450*		Statistically Significant
Academic Technology Director (n = 14)		0.24	eLearning Directors feel that they have the highest over performance of ñAcademic Technology Managementò responsibilities, while those with the title of Other underperform in this area.
eLearning Director (n = 2)		4.44	
Instructional Designer (n = 10)		0.87	
Other (n = 46)		-0.21	

* Significant at least the 0.05 level

Research and assessment gap. *Is there a relationship between the magnitude of the gap in the Research and Assessment activities of the respondents and their background characteristics?*

Analysis of variance was conducted. The magnitude of the gap in performance in ñResearch and Assessmentò responsibilities was the dependent variable and the professional

background and characteristics of the respondent was the independent variable. Statistically significant differences existed therefore a Fisherôs LSD was applied.

The *type of college* employing the respondent (Table I53), the respondentôs *academic degree level* (Table I55), *employment background* (Table I56), relationship with a specific *institutional unit* (Table I57) and *years in current position* (Table I58) and what the position is *considered* (Table I59) had p-values greater than the 0.05 level; it was concluded that these characteristics have no statistically significant influence in the perceived participation in ñResearch and Assessment.ò

The *official title* of the respondent had a p-value of 0.049 (Table I54), indicating that there were statistically significant differences in the participation in ñResearch and Assessmentò activities based on their *official title*. Those with the title of *Instructional Designer* reported that they over perform in ñResearch and Assessment,ò while *Academic Technology Director's*, *eLearning Director's* and *Other* reported that they under perform in this area (Table 19).

Table 19
Research and Assessment Obligations and Responsibilities Gap

Characteristic	p-level*	Mean	Performance of Obligation and Responsibility
Official Title	0.049		Statistically Significant
Academic Technology Director (n = 14)		-0.47	Those with an official title of ñAT Director,ò ñeLearning Directorò and those respondents with a title of ñOtherò reported they underperform Research and Assessment obligations and responsibilities while ñInstructional Designersò feel they over perform in this area.
eLearning Director (n = 2)		-3.22	
Instructional Designer (n = 10)		0.37	
Other (n = 46)		-0.81	

* Significant at least the 0.05 level

Answer to Research Question 4

Research question 4: *Is there a relationship between the magnitude of the gap in performance in obligations and the professional background and characteristics of the AT professionals?* concerned the magnitude of the gap in performance of the five categories of responsibilities. ANOVA was performed and where statistical significant differences were found a Fishers LSD test was performed to discover if the professional characteristics of the respondents effected the gap. It was determined that the magnitude of the gap in performing ñStrategic Planningò responsibilities was influenced only by the institutional unit that the ATP was connected. The *official title* of the ATP effected the performance gap in ñInstructional Design,ò ñOngoing Personal Professional Development,ò ñAcademic Technology Managementò and ñResearch and Assessmentò responsibilities.

Research Question 5: Participation in Decision Making

Research question number 5 asks: ñTo what extent do AT professionals believe that they participate in institutional AT decision making?ò

Two survey questions were directly related to this question. The respondents were asked to rate the degree to which they agree to the survey statements on a scale of 1 ï 5, where 1 was Strongly disagree and 5 = Strongly agree. The two survey statements were questions number 34: *I have the opportunity to express my perspective or make recommendations for a particular cause of action*; and 35: *I believe my recommendations effect the decision making process at my institution*.

To determine whether respondents believe that they participate in AT decision making, the average score of the responses associated with this question was calculated, as shown in Table 20. The majority of the respondents agree that they have an opportunity to express their

recommendation and believe that their recommendation effects the decision making process at their institution (Table 20). The frequency distribution tables are located in Appendix J Tables 60 and 61.

Table 20
Perception of Participation in Decision Making (by percentage)

	Strongly Agree 5	Agree 4	Neither Agree nor Disagree 3	Disagree 2	Strongly Disagree 1
I have an opportunity to express my perspective or make recommendations for a particular cause of action	36%	38%	14%	4%	7%
I believe my recommendations effect the decision making process at my institution.	24%	37%	20%	11%	7%

Figure 11 shows the comparison of the results of the averages. When an AT professional has the opportunity to express a perspective or make a recommendation, he or she believes that it affects the decision making process.

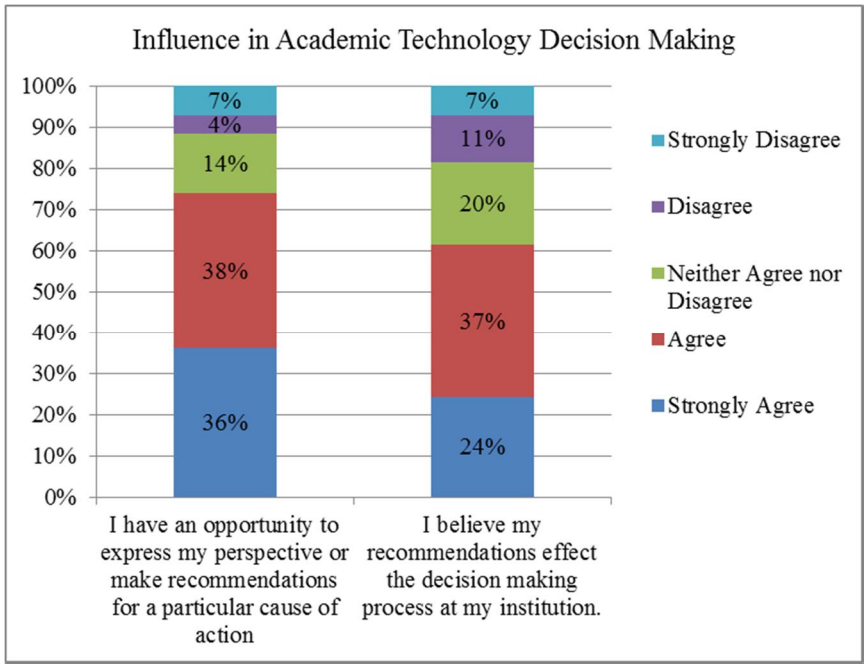

Figure 11. Influence in Academic Technology Decision Making

To determine the influence that respondents believe they have on campus, the averages of the responses to Research Question 5: ñTo what extent do AT professionals believe that they participate in institutional AT decision making?ò were added together (Figure 12). A majority, 68%, of the respondents believe that they influence the decision making process at their institution.

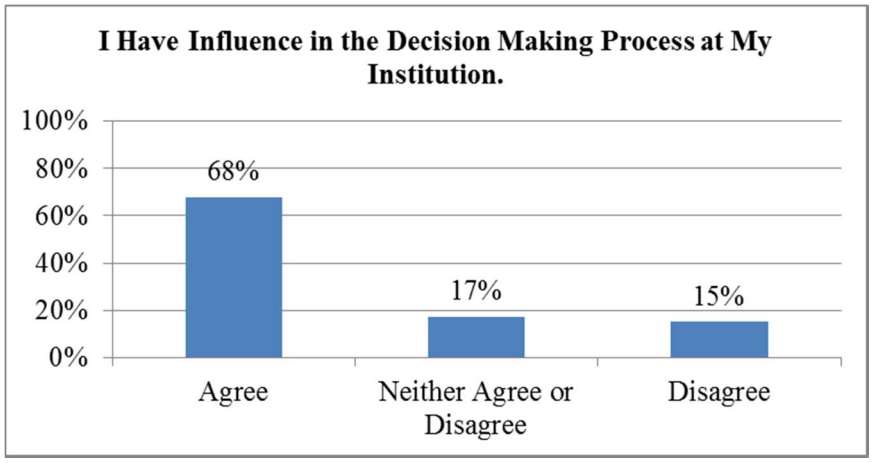

Figure 12. I have influence in the decision making process at my institution

Answer to Research Question 5

Almost ¾ of the respondents, 74%, believe they have the opportunity to express their perspective or make recommendations for a particular cause of action in AT decision making, while 14% neither agree nor disagree and 12% disagree that they have the opportunity to express their perspective or make recommendations. Of those who are given the opportunity to make a recommendation, 61% believe that their recommendation affects the decision making process, while 20% are unsure and 19% of the respondents believe that their recommendation has no effect on the decision making process at their institution.

Research Question 6: Relationship of Magnitude

Research question number 6 asks: ñIs there a relationship between the magnitude of the gap in performance of the obligations and responsibilities and the degree of perceived participation in decision making?ò To address this research question, correlation analysis was conducted between the magnitude of the gap in respondentsô performance of their obligations and the degree of their perceived participated in institutional AT decision making. The Pearsons Correlation Table is located in Appendix K Table 62.

Responses to four survey statements were used as measures of perception in participation in institutional decision making. The four statements are:

34. *I have the opportunity to express my perspective or make recommendations for a particular cause of action.*
35. *I believe my recommendations effect the decision making process at my institution.*
36. *I believe learning technologies are effectively used at my institution.*
37. *In my opinion, my superiors believe that learning technologies are effectively used at my institution.*

The gap in performance for each factor was calculated by Pearson correlation coefficients and the corresponding p-values were calculated. Statistically significant relationships were observed between all of gaps in performance of respondentsô obligations to their responsibilities and their perceived degree of participation in decision making.

Cohen (1988) suggested some guidelines for interpreting the strength of linear correlations. He suggested that a weak correlation typically had an absolute value of r = .10 (about 1% of the variance explained), a moderate correlation typically had an absolute value of r = .30 (about 9% of the variance explained) and a strong correlation typically had an absolute value of r = .50 (about 25% of the variance explained).

According to Cohenôs criteria, a strong positive correlation existed between respondentôs gap in *Strategic Planning* and the degree to which they perceived they had an opportunity to express their perspective or make recommendations for a particular cause of action (r = 0.434336), believed that their recommendations effected the decision making process (r = 0.410415) and the extent to which they believe learning technologies are effectively used at their institution (r = 0.436820). That is, the stronger the perception that the respondents have that they had an opportunity to express their perspective, make recommendations for a particular cause of action, and that learning technologies were effectively used, the less likely they were to perform *Strategic Planning* at a higher frequency than the believed they should.

There is a moderately-strong relationship between the respondentôs gap in the performance of *Instructional Design* and *Research and Assessment* obligations and responsibilities and the degree to which they perceived they had an opportunity to express their perspective or make recommendations for a particular cause of action (r = 0.303011, r = 0.306415), believed that their recommendations effected the decision making process (r =

0.326914, r = 0.340249) and the extent to which they believe learning technologies are effectively used at their institution (r = 0.342722, r = 0.440392). The respondents are moderately unlikely to perform Instructional Design and Research and Assessment responsibilities at a higher frequency than they should.

There is also a moderately-strong correlation between the respondentôs belief that their superiors believe that learning technologies are effectively used (r = 0.384423) and the gap in which they perform Research and Assessment responsibilities at a higher frequency than they should.

There is a moderately-weak relationship between the performance gap of *Ongoing Personal Professional Development* and the degree to which they perceived they had an opportunity to express their perspective or make recommendations for a particular cause of action (r = 0.246801), believed that their recommendations effected the decision making process (r = 0.247217) and the extent to which they believe their superiors believe that learning technologies are effectively used at their institution (r = 0.252426). The respondents are less likely to participate in Ongoing Personal Professional Development activities at a higher frequency than they believe they should participate.

There is a moderately-weak to weak relationship between the respondentôs gap in the performance *Management of Academic Technology* responsibilities and the degree to which they perceived they had an opportunity to express their perspective or make recommendations for a particular cause of action (r = 0.234816) and the extent to which they believe learning technologies are effectively used at their institution (r = 0.257246). These respondents are less likely to perform *Management of Academic Technology* responsibilities at a higher frequency than they believe they should perform. The respondents were also moderately unlikely to

perform Instructional Design and Research and Assessment responsibilities at a higher frequency than they should (Table 21).

Table 21
Gap in Performance of Responsibility (n = 67)

	I have an opportunity to express my perspective or make recommendations for a particular cause of action. (r, p-value)	I believe my recommendations effect the decision-making process at my institution. (r, p-value)	I believe learning technologies are effectively used at my institution. (r, p-value)	In my opinion, my superiors believe that learning technologies are effectively used at my institution. (r, p-value)
Strategic Planning	0.434336 (0.000240*)	0.410415 (0.000562*)	0.436820 (0.000219*)	0.174062 (0.158916)
Instructional Design	0.303011 (0.012686*)	0.326914 (0.006930*)	0.342722 (0.004525*)	0.156249 (0.206713)
Ongoing Personal Professional Development	0.246801 (0.044072*)	0.247217 (0.43706*)	0.196352 (0.111270)	0.252426 (0.039321*)
Academic Technology Management	0.234816 (0.045784*)	0.206607 (0.093450)	0.257246 (0.035595*)	0.101590 (0.413345)
Research and Assessment	0.306415 (0.011673*)	0.340249 (0.004844*)	0.440392 (0.000192*)	0.384423 (0.001319*)

* Statistically significant at least the 0.05 level of significance.

Answer to Research Question 6

Research question 6: Is there a relationship between the magnitude of the gap in performance and the degree of perceived participation in decision making? focused on whether or not there was a relationship between the magnitude of the gap in performance of the obligations and responsibilities and the degree of perceived participation in decision making. According to Cohenôs (1988) criteria, the stronger the perception that the respondents have that they had an opportunity to express their perspective, make recommendations for a particular cause of action, and that learning technologies were effectively used, the less likely they were to

perform ñStrategic Planningò and ñInstructional Designò duties and, moderately likelihood that they would participate in ñOngoing Personal Professional Developmentò and ñResearch and Assessmentò activities at a higher frequency than the believed they should.

Summary

The goals of the study were to create a snapshot of the current roles and responsibilities of AT professionals in higher education. To achieve these goals the following six research questions were asked:

1. What are the major areas of responsibilities of AT professionals?
2. To what extent do AT professionals believe they fulfill their perceived level of obligations across the areas of responsibilities determined in Research Question 1?
3. Is there a gap in performance across the areas of responsibilities?
4. Is there a relationship between the magnitude of the gap in performance in obligations and the professional background and characteristics of the AT professionals?
5. To what extent do AT professionals believe that they participate in institutional AT decision making?
6. Is there a relationship between the magnitude of the gap in performance and the degree of perceived participation in decision making?

To answer these questions a survey was conducted of AT professionals. The survey was available online for two weeks. The survey asked the respondents to measure on a scale of 1-5 their current performance of a task, what they *do*, and what they think they *should* do, the study was designed to identify perceived gaps in the responsibilities and to discover the influence, if any, that AT professionals currently believe they have on college campuses. Seventy-one

respondents completed the survey. The results of the survey were analyzed using descriptive statistics techniques.

The majority of the respondents to the survey work at a 4-year baccalaureate college and hold a masterôs degree. The AT professional respondents have different professional backgrounds, though a majority come from the broad field of education. The AT professionals have no clear official position title, though many are some type of ñdirector.ò Approximately half of the respondents are considered staff and a quarter are faculty. The majority of the AT professionals surveyed are connected to the IT unit of their institution with less than a quarter of these individuals affiliated with the academic executive branch or Provost Office.

A factor analysis test was done to answer the first question: ò What are the major areas of responsibilities of AT professionals?ò Five categories were deduced which represent 97% of the variation of the data. The five major areas of responsibilities of AT professionals are, in order of commonality:

1. Strategic Planning
2. Instructional Design
3. Ongoing Personal Professional Development
4. Academic Technology Management
5. Research and Assessment

The mean was calculated from the results of research question number 1 to answer research question number 2: ñTo what extent do AT professionals believe they fulfill their perceived level of obligations across the areas of responsibilities determined in Research Question 1?ò The respondents believe that they should be performing all of the responsibilities more than they

currently are with the biggest difference *in Ongoing Personal Professional Development* and *Academic Technology Management*.

Research question 3 asked ñIs there a gap in performance across the areas of responsibilities?ò The results showed that the respondents believe that they are underperforming all of their responsibilities and obligations. The under-performances of ñAcademic Technology Managementò and ñResearch and Assessment ñ are more frequent than the underperformance of ñStrategic Planningò and ñInstructional Design,ò while ñOngoing Personal Professional Developmentò has the smallest under-performance.

Research question 4 asked if there was a relationship between the gap in performance of the five categories of responsibilities and the background and characteristics of the AT professionals? ANOVA and Fishers LSD were performed and it was determined that the magnitude of the gap in performing ñStrategic Planningò responsibilities was influenced only by the institutional unit that the ATP was connected. The *official title* of the ATP effected the performance gap in ñInstructional Design,ò ñOngoing Personal Professional Development,ò ñAcademic Technology Managementò and ñResearch and Assessmentò responsibilities and obligations.

To what extent do AT professionals believe that they participate in institutional AT decision making was the 5th research question. It was discovered that approximately ¾ of the respondents believe that they have the opportunity to express their perspective or make recommendations for a particular cause of action in AT decision making. Sixty-one percent of the respondents believe that their recommendation affects the decision making process at their institution.

The final research question asked whether or not there was a relationship between the magnitude of the gap in performance of the obligations and responsibilities and the degree of

perceived participation in decision making. The results showed that the stronger the perception that the respondents have that they had an opportunity to express their perspective, make recommendations for a particular cause of action, and that learning technologies were effectively used, the less likely they were to perform ñStrategic Planningò and ñInstructional Designò duties and, moderately likelihood that they would participate in ñOngoing Personal Professional Developmentò and ñResearch and Assessmentò activities at a higher frequency than the believed they should.

Chapter 5: Conclusions

Overview

Forms of technology have had a presence in higher education for generations, increasing exponentially over the last few decades in all aspects of college life (Oblinger, 2010), yet many Information Technology (IT) systems are based on technical requirements set by the IT staff rather than on academic goals set by the provost or faculty (Metros, 2010). To be contemporary and effective, colleges and universities must have a strategic Academic Technology (AT) agenda that focuses on pedagogic changes that will enable students to synthesize information and link it to real world situations (Privateer, 1999). Some suggest that higher education institutions need to develop a strategically guided approach to technology in education (Privateer, 1999). The problem is that many higher education institutions do not have an organized AT strategy or AT professionals who can implement this strategy across campus. Making the issue complex is that AT is constantly changing, AT is ill defined and AT professionals have a myriad of responsibilities. College and university executives often view technology as a tool and a service that is used to enhance traditional classroom teaching rather than something that can transform the teaching of necessary skills to students who will live and work in a knowledge-based society (Bates & Sangra, 2011).

Often colleges and universities have one IT department to oversee all of their goals and needs, administrative, such as managing payrolls, and academic, such as supporting classroom instruction. IT professionals who keep the physical plant going are often ill trained to support effective use of instructional tools, but in many universities the same group of people is charged with both tasks. For colleges and universities to be contemporary and effective, they must have an AT agenda, managed by AT professionals, that can support technology-mediated instruction

that is informed by cutting edge pedagogy. AT professionals, who understand technological applications and educational goals, can communicate their knowledge to non-technical people, and can work with faculty and students to improve education. In order for this to happen there needs to be a dedicated resource on campus under the leadership of an Academic Technology Officer (Nworie & Albright, 2008; Nworie & Haughton, 2008; Privateer, 1999). Further, in order for AT strategy to be truly successful, this dedicated AT officer needs to be in an influential position on campus (Privateer, 1999).

The purpose of this study was to discover the roles, responsibilities and obligations of AT professionals in higher education and to measure the perceived influence that they believe that they have on campus and the level of influence they believe they *should* have in institutional AT decision making and strategic planning.

Summary of Study Results

A factor analysis study was conducted of individuals who describe themselves as AT professionals. Seventy-one AT professionals completed an online survey. The majority of the respondents work at a 4-year baccalaureate college and hold a masterôs degree. About ¾ of the respondents have an employment background in education, half of this experience in teaching. Many of the professionals do not have a position title that fit within the survey choices. Approximately half of the respondents are considered staff connected to the IT unit of their institution. Less than a quarter of these individuals are affiliated with the academic executive branch or Provost Office.

Summary of RQ 1: Major responsibilities of AT professionals. The first research question of this study: ñWhat are the major areas of responsibilities of AT professionals?ò was asked in order to categorize the roles, responsibilities and obligations of AT professionals. A

factor analysis of the data, accounting for 97% of the variation in data, revealed that AT professionals primarily have responsibilities and obligations in the following five categories:

1. Strategic Planning
2. Instructional Design
3. Ongoing Personal Professional Development
4. Academic Technology Management
5. Research and Assessment

Summary of RQ 2: Fulfillment of responsibilities. The second research question: ñTo what extent do AT professionals believe they fulfill their perceived level of obligations across the areas of responsibilities determined in Research Question 1?ò sought to examine the extent that the respondent AT professional fulfills the responsibilities and obligations defined in research question one. The survey asked the respondents to indicate the level to which they ñdoò perform a specific responsibility and the level which they feel they ñshouldò perform the responsibility. The average score of the ñdoò and ñshouldò responses were calculated. Where the mean score of the ñshouldò response was greater than the ñdoò response, the respondent believed that they responsibility should be fulfilled to a greater extent than it is currently. This was the case with all of the responsibilities, with the greatest differences in *Ongoing Personal Professional Development* and *Academic Technology Management*. In other words, though AT professionals believe they should fulfill all of the responsibilities more than they do, this is especially so in the areas of *Ongoing Personal Professional Development* and the *Academic Technology Management*.

Summary of RQ 3: Gap in Performance of Responsibilities. As research question 2 showed, there is a difference in fulfillment of responsibilities by AT professionals. Research question 3: ñIs there a gap in performance across the areas of responsibilities?ò sought to identify perceived gaps in those responsibilities and obligations. A statistical paired t-test was conducted to determine if there were any significant gaps between the levels that responsibilities were performed. It was determined that there was a significant gap in performance across all the stated responsibilities and obligations that AT professionals perform.

Summary of RQ 4: Relationship of performance gap and respondent characteristics. After it was determined that there were significant gaps in the fulfillment and performance of AT responsibilities, research question 4: ñIs there a relationship between the magnitude of the gap in performance in obligations and the professional background and characteristics of the AT professionals?ò identified the magnitude of the gaps and compared it to the characteristics of the respondent. It was discovered that only two respondent characteristics, *institutional unit connected to* and *official title*, influenced the performance gap of responsibilities. The performance of ñStrategic Planningò responsibilities was influenced by the *intuitional unit connected to* with ATPôs connected to the *Media Center* reporting the greatest underperformance and those connected to *IT* the least underperformance. The *official title* of an AT professional effected the performance level of ñInstructional Design,ò ñOngoing Personal Professional Development,ò ñAcademic Technology Managementò and ñResearch and Assessmentò responsibilities.

AT professionalôs with the official title of *Academic Technology Director* and *eLearning Director* report that they underperform in the areas of ñInstructional Designò and ñResearch and Assessmentò and over participate in ñOngoing Personal Professional Development.ò Those with

the title of *Instructional Designer* report that they over perform in the areas of ñInstructional Designò and ñResearch and Assessmentò and over participate in ñOngoing Personal Professional Development.ò

Summary of RQ 5: Extent of participation in AT decision making. Research question 5: ñTo what extent do AT professionals believe that they participate in institutional AT decision making?ò sought to answer to what extent ATPôs believe that they participate in institutional AT decision making. It was found that the majority of respondents agree that they have an opportunity to express their recommendation for a particular course of action and that these recommendations effect the decision making process at their institution.

Summary of RQ 6: Relationship between gap in performance and AT decision making. Finally the study sought to answer research question 6: ñIs there a relationship between the magnitude of the gap in performance and the degree of perceived participation in decision making.ò It was found that the stronger perception the respondents had that they have the opportunity to express their perspective and make a recommendation for AT decision making, the less likely there were to over perform in the areas of ñStrategic Planningò and ñInstructional Designò and they are moderately likely to over participate in ñOngoing Personal Professional Developmentò and over perform ñResearch and Assessmentò responsibilities.

To this end, relationships and trends were identified in the resulting data, and three conclusions became evident: a) AT professionals underperform Academic Technology Responsibilities b) AT decisions appear to be made based on technological rather than pedagogical considerations; and c) AT Professionals have the opportunity to express their opinions and influence AT decision making at their institution. These conclusions have an effect

on the field of AT as a whole, the individuals who are working in the field, and those who are affected by the AT decisions that are made.

Conclusions

AT Professionals underperform academic technology roles. In this study the research results show that AT professionals (ATPôs) perform their responsibilities and obligations less than they believe that they should be performing them.

The findings. Research questions 2 and 3 concentrated on the extent to which AT professionals fulfill their obligations and responsibilities and whether or not there is a gap in their performance and if the gap in performance is relational to the professional background characteristics of the ATP. The average score of the responses to the ñdoò and ñshouldò statements were calculated and the mean, mode, median and standard deviation was determined (Tables L63 and L64). The results show that across all of the responsibilities and obligations of ATPôs there is a feeling that they should be performing them more than they currently are performing (Table L65). Academic Technology Management was the least performed responsibility with a mean of 2.60 (Table L66).

The literature. AT is an integral and essential component of almost all core higher education activities and needs to be managed as such (Bates & Sangra, 2011). ATPôs tend to be considered supervisors in both the administrative and the academic domains of a college or university. On one hand they support institutional efficiency and continually monitor the cost-effectiveness of the applied technology, while on the other, they maintain the quality of the academic program and the proper application and implementation of technology in the curriculum and teaching on campus (Sellers, 2005).

Traditionally ATPôs have been charged and specifically designated by higher education institutions to oversee and support the use of every aspect of instructional technology campus-wide, including the use of media, instructional development, and management of technology and media resources (Nworie, 2005). As has been written in the literature (Bates & Sangra, 2011), the responsibilities of ATPôs has been increasing and the data proves this trend. ATPôs fulfill their responsibilities, but not to their desired level.

Implications. As AT has expanded in higher education, so too has the responsibilities of the ATP. Those responsibilities now include *Strategic Planning*, *Instructional Design*, *Ongoing Personal Professional Development*, *Academic Technology Management* and *Research and Assessment*. ATPôs believe that they underperforming their professional responsibilities. It seems that the expectations of the institution have expanded the scope of the ATP and there is not enough time and resources to perform the functions as the ATP feels is necessary.

AT professionals perform more technology than pedagogy. In this study the research data show that the Academic Technology organization structure favors the technological side of the institution rather than the pedagogic side.

The findings. AT professionals (ATPôs) are attached to the Information Technology departments, under the leadership of the Chief Information Officer (or Chief Financial Officer), rather than connected to Provost Office (academic executive branch of the institution). Despite the ATPôs background in education (Figure L16) only 22%, less than ¼, of the study respondents were connected to the provost office. Over ¾ of the AT professionals who participated in the study are part of a non-academic department of the college or university (Figure L17). ATPôs who are affiliated with the office of the Academic Executive (Provost Office) underperform strategic planning responsibilities (Figure L18).

The literature. The strategic importance of technology to the university has increased and entrusting AT to individuals who are experts in technology but not in pedagogy is dangerous (Jackson, 2010). AT is mission critical to the university and decisions regarding AT need to be made by individuals who have a strong understanding of the academic goals of the university (Bates & Sangra, 2011). According to Sellers (2005), IT is central to the educational administration of higher education institutions, yet as Brown states, IT departments have, in the past, been considered indifferent at best, and openly resistant at worst, to the needs of their customers: students and faculty (Brown, 2004). Furthermore, with IT at the center of the administrative structure, technology is driving many academic decisions (Sellers, 2005) and there seems to be a lack of consensus on how technology should be used and integrated into universities (Yulong & Runyun, 2004). The CIO, typically the head of IT, is charged by the university to ensure that his institution uses technology to its maximum long-term benefit (Jackson, 2010) and to many, technology for teaching and learning is a *desirable nice-to-have* rather than a core component of the institutions technology repertoire. Technology is best integrated into teaching and learning when the related decisions are made in conjunction with other academic decisions such as content, pedagogy and teaching methods (Bates & Sangra, 2011).

The literature emphasizes the importance of having an AT professional, who understands technology and itôs pedagogical uses, in a position of importance and leadership in the institution (Nworie & Albright, 2008; Privateer, 1999). The data clearly proves that a minority of AT professionals are affiliated with an academic executive branch of the institution, such as the Provost office, rather, the majority of ATPôs are found within the IT units of their institution.

Implications. It is an interesting phenomenon that AT professionals seem to be relegated to technology positions and not academic positions. The majority of the AT professionals have a background in education, but when the term ñtechnologyò was added to their position, they became technology professionals. A curious situation arises, do these AT professionals, who have an education background understand the ways and wherewithal of the technology departments that they are associated with?

Strategic planning and leadership is important for all institutions, and the academy will be well served to include AT professionals in the process. These professionals will bring to the table, among other things, an understanding of technologyôs role in achieving successful learning in a knowledge-based society; developing specific competencies in the use of information and communication technologies within specific academic disciplines; generating flexible program delivery methods to accommodate a wider and more diverse student body; redesigning courses to better integrate technology; and increasing efficiencies using technology to achieve better outcomes at a lower cost (Yulong & Runyun, 2004).

For AT professionals who are interested in leadership, Kay Persichitte, Dean of Education at the University of Wyoming, suggests that AT leadership in higher education ñis about balance, preparation, judgment, and the perpetual education needed for all our colleagues and constituentsò (Persichitte, 2013). AT leaders should be considered thought leaders (Chester, 2011) of the institution and become advocates for effective and appropriate delivery of academic technologies. But even without an executive or leader based job title, AT professionals need to be persistent in leading from their position in the organization. Influential activity is not limited to executives, but to those people who can energize movement in the organization (Zander & Zander, 2000).

While not all AT professionals may want to be a leader at their school, they can influence the AT decisions that are made because they are in a unique position that bridges both the technology and academic worlds. They have the experience and understanding needed to advise on the AT decision-making process and can influence decisions from any position in the network. It is incumbent upon them to advocate for the best technology decisions possible for teaching and learning.

AT professionals have opportunity to share, do influence, but not consulted. In this study the research results show that AT professionals have opportunity to express their perspective or make a recommendation for a particular cause of action and when they do have this opportunity they believe that their recommendations influence AT decision-making at their institutions.

The findings. AT professionals report being given the opportunity to express an opinion or recommendation and when they do so they believe that their recommendation has an effect on the decision making process. Seventy-four percent of the respondents strongly-agree or agree that they are given an opportunity and an additional 14% were ambivalent about whether or not they had an opportunity to express a recommendation on an AT decision. More than 2 / 3of the respondents believe they have the opportunity to effect the AT decision making process at their institution.

When AT professionals are given the opportunity to express a recommendation 61% believe that their recommendation effects the AT decision making process at their institution. A majority of those who do have the opportunity to make a recommendation believe that their views are considered as part of the decision making process.

The literature. Eugene Kowch finds that that there are few AT professionals in executive leadership positions in higher education (Kowch, 2013). However, the literature further suggests that decisions for integrating technology into teaching and learning should be made in conjunction with other academic decisions under the leadership of an AT professional (Bates & Sangra, 2011; Nworie & Albright, 2008; Privateer, 1999). Privateer continues to express the need for an institution wide AT agenda under strong AT leadership (Privateer, 1999). The data shows that current ATPôs believe that they have influence in AT decision making, but as they are overwhelmingly affiliated with IT and not academia their influence is limited to the technological side of the institution.

Implications. AT professionals who are skilled in both technology and pedagogy have the ability to influence curriculum reform and changes in teaching methods that facilitate the development of skills in a particular subject domain, and by influencing changes in assessment ensure those skills are evaluated (Bates & Sangra, 2011). These additional responsibilities and successful change requires the opportunity to influence the AT decision making process. The data supports this opinion that AT professionals have an opportunity to express their opinion or recommendation and influence AT decision making at their institution.

Suggestions for Further Research

The purpose of this research was to explore the influence that AT professionals have on college and university campuses. It was discovered that AT professionals have influence in higher education institutions. The research also showed that AT, as a profession and a field, still has room to grow and develop. The field of AT needs to be clearly defined with stated roles, responsibilities, and obligations.

The scope of AT positions need to encompass the roles, responsibilities and obligations that AT professionals perform. Institutions need to align their expectations based on these roles, responsibilities and obligations. This will benefit current professionals in the field, who will be able to explain their jobs and to advance on the career ladder if they desire.

ATPôs participate in Ongoing Personal Professional Development opportunities and AT organizations should base these opportunities on professional responsibilities and obligations including, but not limited to: *AT Strategic Planning*; *Instructional Design*; *AT Management*; and *Research and Assessment*. Further, AT professional development organizations should encourage expertise in the field. This could benefit current AT professionals, higher education institutions, and individuals aspiring to enter the field. Additionally, professionals working in the field will gain more influence in higher education strategic planning and decision making. In the end, it will be the students who reap the reward: Technology will be implemented in higher education, not to technology considerations, rather in alignment with education goals.

This study raised questions about AT roles and responsibilities that deserve further study. Two areas important to the field of AT that should be concentrated on are AT leadership and AT in higher education. Professor Eugene Kowch recently asked if AT professionals want to be leaders in their institution or are satisfied with the influence that they have (Kowch, 2013). AT leadership research should include a study to understand why AT directors feel that they over participate in professional development? Is the feeling of over participation related to an indeterminate career path?

The field of AT is influenced by higher education institutions. For AT professionals to be influential research should be conducted to understand the academy and their relationship to AT. Do higher education institutions have AT plans, both short and long term, or are they

making decisions *just in time*? If the institutions do have plans, who is responsible for implementing the plans, AT professionals or the CIO? Further research in these areas will enhance the field of AT and solidify the AT leadership position on campus.

The data suggest that additional study is needed to ascertain the scope of the AT position on campus. Does the stated scope of work and responsibilities accurately reflect the responsibilities and obligations that the ATP is performing? Are there other expected responsibilities? If so, what are they and should they be a part of this position or a separate position?

This study used the survey instrument to measure the tension between what AT professionals did and what they are constrained, by their institution, in doing. A possible next step for this research is to use the survey as an instrument to measure the success of the institutions. What do the institutions feel they should be doing and what are the constraints? This tool can assist in alignment of expectations between institutions and the people that work for them.

Summary

The field of AT seems to be insufficiently defined, making it difficult for AT professionals to be categorized and characterized or to reap the benefits of following a career path. There is uncertainty as to the roles, responsibilities and positions of AT professionals both within and outside of the field.

AT professionals are underrepresented in academic leadership on their campus. Notwithstanding the findings that AT professionals are primarily found within the IT department, when given the opportunity to make a recommendation they believe that the recommendation influences decisions that affect campus technology and its appropriate

integration into teaching and learning. Research in this area is minimal, and this study highlights the need for more research and strategic action to support and further AT influence and leadership and AT in the academy (Kowch, 2013; Nworie & Albright, 2008; Privateer, 1999).

A descriptive study was conducted to describe the current AT professionals perception of their influence on the decision-making process at their institution. An online survey queried 81 AT professionals and statistical factor analysis of the responses identified the five most cited responsibilities and compared differences between what the professionals ñdoò and what they believed they ñshouldò do. ANOVA was used to calculate the resulting gaps in performance based on the ñdoò and ñshouldò responses.

The data supported three conclusions: a) AT professionals underperform in their AT roles; b) AT professionals perform more technology than pedagogy; and c) when given an opportunity to make a recommendation, they influence AT decision making, but they are rarely given the opportunity. AT is a fast-growing field that deserves attention, given its dynamic nature and its impact on educational practices. The AT field is different from IT, as it concentrates on advancing technology to enhance teaching and learning. Yet the field appears to be insufficiently mature or defined, making it difficult to for AT professionals to be categorized and characterized or to fully understand their changing roles.

AT is at the convergence of pedagogy and technology. AT professionals are in the unique position of being able to influence technology decisions based on educational goals and assist faculty to use technology appropriately to achieve the desired outcome. To ensure student success, higher education institutions need to implement an AT plan to support the needs of the faculty and students. The AT plan needs to be implemented by professionals in the field who are uniquely qualified to bridge the gap between academia and technology.

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APPENDIX A
Memorandum of Understanding

Gmail by Google

Stephanie Glick <glick.stephanie@gmail.com>

LTL question

Malcolm Brown <mbrown@educause.edu> **Wed, Jun 20, 2012 at 4:03 PM**
To: Stephanie Glick <glick.stephanie@gmail.com>

Hi Stephanie, you're good to go! Fine to post a note to the LTL Alum list, inviting them to participate in your survey.

Good luck! Hope you get a good turnout. And do let me know what you discover; I'm very interested.
M

Malcolm Brown
Director, EDUCAUSE Learning Initiative
email: mbrown@educause.edu
IM: fnchron (AIM)
Voice: 575-448-1313

Phillip Harris [pharris@aect.org]

Sent: Wednesday, March 06, 2013 12:59 PM
To: Glick, Stephanie (student)

Stephanie the Executive Committee approved your research request to survey the membership of AECT. The committee did ask me to ask you to provide a more detailed description of the audience you want as it appeared that EduCause might be a more appropriate organization for the group you are seeking. If you have questions about this feel free to give me a call. The telephone number is 812-335-7675.

Cordially,
Phillip Harris Ed.D.
Executive Director
AECT

APPENDIX B
Pepperdine University IRB Approval

PEPPERDINE UNIVERSITY

Graduate & Professional Schools Institutional Review Board

April 22, 2013

Stephanie Glick

Protocol #: E0213D08
Project Title: Exploring Academic Technology Leadership in Higher Education

Dear Ms. Glick,

Thank you for submitting your application, **Exploring Academic Technology Leadership in Higher Education**, for expedited review to Pepperdine University's Graduate and Professional Schools Institutional Review Board (GPS IRB). The IRB appreciates the work you and your advisor, Paul Sparks, completed on the proposal. The IRB has reviewed your submitted IRB application and all ancillary materials. As the nature of the research met the requirements for expedited review under provision Title 45 CFR 46.110 (Research Category 7) of the federal Protection of Human Subjects Act, the IRB conducted a formal, but expedited, review of your application materials.

I am pleased to inform you that your application for your study was granted **Full Approval.** The IRB approval begins today, **April 22, 2013,** and terminates on **April 22, 2014**. In addition, your application to waive documentation of informed consent, as indicated in your **Application for Waiver or Alteration of Informed Consent Procedures** form has been **approved.**

Your final consent form has been stamped by the IRB to indicate the expiration date of study approval. One copy of the consent form is enclosed with this letter and one copy will be retained for our records. **You can only use copies of the consent that have been stamped with the GPS IRB expiration date to obtain consent from your participants.**

Please note that your research must be conducted according to the proposal that was submitted to the GPS IRB. If changes to the approved protocol occur, a revised protocol must be reviewed and approved by the IRB before implementation. For ***any*** proposed changes in your research protocol, please submit a Request for Modification form to the GPS IRB. Please be aware that changes to your protocol may prevent the research from qualifying for expedited review and require submission of a new IRB application or other materials to the GPS IRB. If contact with subjects will extend beyond **April 22, 201**, a **Continuation or Completion of Review Form** must be submitted at least one month prior to the expiration date of study approval to avoid a lapse in approval.

A goal of the IRB is to prevent negative occurrences during any research study. However, despite our best intent, unforeseen circumstances or events may arise during the research. If an unexpected situation or adverse event happens during your investigation, please notify the GPS IRB as soon as possible. We will ask for a complete explanation of the event and your response. Other actions also may be required depending on the nature of the event. Details regarding the timeframe in which adverse events must be reported to the GPS IRB and the appropriate form to be used to report this information can be found in the *Pepperdine University Protection of Human Participants in Research: Policies and Procedures Manual* (see link to "policy material" at http://www.pepperdine.edu/irb/graduate/).

Please refer to the protocol number denoted above in all further communication or correspondence related to this approval. Should you have additional questions, please contact me. On behalf of the GPS IRB, I wish you success in this scholarly pursuit.

Sincerely,

Doug Leigh, Ph.D.
Chair, Graduate and Professional Schools IRB
Pepperdine University
Graduate School of Education & Psychology
6100 Center Dr. 5th Floor
Los Angeles, CA 90045
Doug.Leigh@pepperdine.edu
W: 310-568-2389
F: 310-568-5755

cc: Dr. Lee Kats, Vice Provost for Research and Strategic Initiatives
Ms. Alexandra Roosa, Director Research and Sponsored Programs
Doug Leigh, Graduate School of Education & Psychology
Paul Sparks, Graduate School of Education & Psychology

APPENDIX C
Expert Review

Thank you for agreeing to participate in my panel of Academic Technology experts. You have been asked to participate due to your experience in the field and working with Academic Technology on campus. Each research question will be stated below followed by the corresponding survey questions. After each question you will be asked whether the survey question adequately address the research question (RQ). If it does, please mark ñKeep it.ò If the question does not, mark ñDiscard it.ò If you have a suggestion for modification, please note it in the space allotted. A majority rule will decide any discrepancies.

Thank you again,

Stephanie Glick
Doctoral Student, Learning Technologies
Pepperdine University
310-709-9708
stephanie.glick@pepperdine.edu

Demographic information of participant:

1. At what type of institution do you work?
    a. Community/ Junior College
    b. Baccalaureate College
    c. Master's Colleges and Universities
    d. Doctorate-granting Universities
    e. Other _____

- *Question adequately addresses the research question – Keep it.*
- *Question does not adequately address the research question – Discard it.*
- *Modify the question as suggested:*

2. What is your official title?

- *Question adequately addresses the research question – Keep it.*
- *Question does not adequately address the research question – Discard it.*
- *Modify the question as suggested:*

5. Which institutional unit is your position primarily connected to?
    a. Academic Technology
    b. Information Technology

c. Media Center
d. Other

- *Question adequately addresses the research question – Keep it.*
- *Question does not adequately address the research question – Discard it.*
- *Modify the question as suggested:*

6. How long have you been serving in your current position?
    a. Years
    b. Months

- *Question adequately addresses the research question – Keep it.*
- *Question does not adequately address the research question – Discard it.*
- *Modify the question as suggested:*

7. I am considered_____
    a. Faculty
    b. Staff
    c. IT
    d. Other (Please Specify) ____

- *Question adequately addresses the research question – Keep it.*
- *Question does not adequately address the research question – Discard it.*
- *Modify the question as suggested:*

<u>RQ 1. What are the major areas of responsibilities of Academic Technology professionals?</u>

8. I oversee the development and support of distance learning courses.

- *Question adequately addresses the research question – Keep it.*
- *Question does not adequately address the research question – Discard it.*
- *Modify the question as suggested:*

9. I provide instructional design support.

- *Question adequately addresses the research question – Keep it.*
- *Question does not adequately address the research question – Discard it.*
- *Modify the question as suggested:*

10. I research future trends in technology and education and how best the technology will serve the institutionôs mission.

- *Question adequately addresses the research question – Keep it.*
- *Question does not adequately address the research question – Discard it.*
- *Modify the question as suggested:*

11. I collaborate with campus stakeholders to establish policies and standards on instructional technology issues, hardware, software and their use.

    - *Question adequately addresses the research question – Keep it.*
    - *Question does not adequately address the research question – Discard it.*
    - *Modify the question as suggested:*

12. I assess the impact of academic technology use in teaching.

    - *Question adequately addresses the research question – Keep it.*
    - *Question does not adequately address the research question – Discard it.*
    - *Modify the question as suggested:*

13. I consult with faculty on curricular improvement.

    - *Question adequately addresses the research question – Keep it.*
    - *Question does not adequately address the research question – Discard it.*
    - *Modify the question as suggested:*

14. I consult with faculty on instructional design.

    - *Question adequately addresses the research question – Keep it.*
    - *Question does not adequately address the research question – Discard it.*
    - *Modify the question as suggested:*

15. I support faculty in new ways of teaching and learning.

    - *Question adequately addresses the research question – Keep it.*
    - *Question does not adequately address the research question – Discard it.*
    - *Modify the question as suggested:*

16. I create online course materials for faculty.

    - *Question adequately addresses the research question – Keep it.*
    - *Question does not adequately address the research question – Discard it.*
    - *Modify the question as suggested:*

17. I create vision and mission statements that match the instructional goals of my institution.

    - *Question adequately addresses the research question – Keep it.*
    - *Question does not adequately address the research question – Discard it.*
    - *Modify the question as suggested:*

18. I participate in the design and standardization of technology classrooms to meet different teaching styles and faculty needs.

    - *Question adequately addresses the research question – Keep it.*
    - *Question does not adequately address the research question – Discard it.*
    - *Modify the question as suggested:*

22. I lead efforts to identify and evaluate next generation learning technologies.

    - *Question adequately addresses the research question – Keep it.*
    - *Question does not adequately address the research question – Discard it.*
    - *Modify the question as suggested:*

29. I manage a staff of Academic Technology professionals.

    - *Question adequately addresses the research question – Keep it.*
    - *Question does not adequately address the research question – Discard it.*
    - *Modify the question as suggested:*

32. I teach education/ academic technology courses at my institution.

    - *Question adequately addresses the research question – Keep it.*
    - *Question does not adequately address the research question – Discard it.*
    - *Modify the question as suggested:*

<u>RQ 2. To what extent do Academic Technology professionals believe they fulfill their perceived level of obligations across the areas of responsibilities determined in Research Question 1?</u>
No new variables are measured.

<u>RQ 3. Is there a gap in performance across the areas of responsibilities?</u>
No new variables are measured.

<u>RQ 4. Is there a relationship between the magnitude of the gap in performance in obligations and the professional background and characteristics of the Academic Technology professionals?</u>

3. What is your highest level of education?
    a. High School
    b. Associates Degree
    c. Technical Degree
    d. Bachelorôs Degree
    e. Masterôs Degree

    - *Question adequately addresses the research question – Keep it.*
    - *Question does not adequately address the research question – Discard it.*
    - *Modify the question as suggested:*

4. How would you describe your background?
    a. Educational (Teaching)
    b. Technical (Computer/IT)
    c. Business
    d. Other

- *Question adequately addresses the research question – Keep it.*
- *Question does not adequately address the research question – Discard it.*
- *Modify the question as suggested:*

26. I attend professional development or training workshops for existing technologies.

- *Question adequately addresses the research question – Keep it.*
- *Question does not adequately address the research question – Discard it.*
- *Modify the question as suggested:*

27. I attend professional development or training workshops for new technologies.

- *Question adequately addresses the research question – Keep it.*
- *Question does not adequately address the research question – Discard it.*
- *Modify the question as suggested:*

28. I attend professional development workshops in educational technology.

- *Question adequately addresses the research question – Keep it.*
- *Question does not adequately address the research question – Discard it.*
- *Modify the question as suggested:*

<u>RQ 5. To what extend do Academic Technology professionals believe that they participate in institutional academic technology decision making?</u>

19. I articulate academic technology objectives to upper management.

- *Question adequately addresses the research question – Keep it.*
- *Question does not adequately address the research question – Discard it.*
- *Modify the question as suggested:*

20. I act as a liaison between upper management and faculty on issues surrounding instructional technology.

- *Question adequately addresses the research question – Keep it.*
- *Question does not adequately address the research question – Discard it.*
- *Modify the question as suggested:*

21. I plan for long term installation and upgrades of technology in classrooms.

- *Question adequately addresses the research question – Keep it.*
- *Question does not adequately address the research question – Discard it.*
- *Modify the question as suggested:*

23. I recommend the purchase and use of learning technologies.

- *Question adequately addresses the research question – Keep it.*
- *Question does not adequately address the research question – Discard it.*
- *Modify the question as suggested:*

24. I investigate and communicate issues relating to changes in instructional technology and faculty expectations to administrators.

- *Question adequately addresses the research question – Keep it.*
- *Question does not adequately address the research question – Discard it.*
- *Modify the question as suggested:*

25. I investigate and communicate issues relating to changes in instructional technology and student expectations to administrators.

- *Question adequately addresses the research question – Keep it.*
- *Question does not adequately address the research question – Discard it.*
- *Modify the question as suggested:*

30. I influence strategic technology decisions.

- *Question adequately addresses the research question – Keep it.*
- *Question does not adequately address the research question – Discard it.*
- *Modify the question as suggested:*

31. I participate in academic technology strategic planning.

- *Question adequately addresses the research question – Keep it.*
- *Question does not adequately address the research question – Discard it.*
- *Modify the question as suggested:*

33. I participate in meetings that impact learning technology at my institution.

- *Question adequately addresses the research question – Keep it.*
- *Question does not adequately address the research question – Discard it.*
- *Modify the question as suggested:*

34. I have the opportunity to express my perspective or make recommendations for a particular cause of action.

- *Question adequately addresses the research question – Keep it.*
- *Question does not adequately address the research question – Discard it.*
- *Modify the question as suggested:*

35. I believe my recommendations effect the decision making process at my institution.

- *Question adequately addresses the research question – Keep it.*
- *Question does not adequately address the research question – Discard it.*
- *Modify the question as suggested:*

36. I believe learning technologies are effectively used at my institution.

- *Question adequately addresses the research question – Keep it.*
- *Question does not adequately address the research question – Discard it.*
- *Modify the question as suggested:*

37. In my opinion, my superiors believe that learning technologies are effectively used at my institution.

- *Question adequately addresses the research question – Keep it.*
- *Question does not adequately address the research question – Discard it.*
- *Modify the question as suggested:*

<u>RQ 6. Is there a relationship between the magnitude of the gap in performance and the degree of perceived participation in decision making?</u>
No new variables are measured.

APPENDIX D
Survey

This survey is an important part of a research project designed to study the roles and responsibilities of Academic Technology Professionals in Higher Education. Your responses will be strictly confidential. Results of this survey will be made available upon request to the researcher or faculty advisor. Thank you for taking the time to complete this survey.

34. At what type of institution do you work?

    a. Community/ Junior College

    b. Baccalaureate College

    c. Master's Colleges and Universities

    d. Doctorate-granting Universities

    e. Other _____

35. What is your official title?

36. What is your highest level of education?

    f. High School

    g. Associates Degree

    h. Technical Degree

    i. Bachelorôs Degree

    j. Masterôs Degree

    k. Doctorate

37. How would you describe your background?

    l. Educational (Teaching)

    m. Technical (Computer/IT)

    n. Business

    o. Other

38. Which institutional unit is your position primarily connected to?

    p. Academic Technology

    q. Information Technology

    r. Media Center

    s. Other

39. How long have you been serving in your current position?

    t. Years

    u. Months

40. I am considered_____

    v. Faculty

    w. Staff

    x. IT

    y. Other (Please Specify) ____

The following are functions and activities of Academic Technology Professionals in Higher Education. Please designate, for each item, **the degree to which I perform each function or activity.** Then, please designate the degree to which I feel I **should perform** each function or activity.

Please rate each statement according to the following scale:
1 = never, 2 = rarely; 3 = sometimes; 4 = usually; 5 = always
Please circle your choice in both columns for each item.

	DOES PERFORM never → always						SHOULD PERFORM never → always					
(8)	1	2	3	4	5	I oversee the development and support of distance learning courses.	1	2	3	4	5	(38)
(9)	1	2	3	4	5	I provide instructional design support.	1	2	3	4	5	(39)
(10)	1	2	3	4	5	I research future trends in technology and education and how best the technology will serve the institutionôs mission.	1	2	3	4	5	(40)
(11)	1	2	3	4	5	I collaborate with campus stakeholders to establish policies and standards on instructional technology issues, hardware, software and their use.	1	2	3	4	5	(41)
(12)	1	2	3	4	5	I assess the impact of academic technology use in teaching.	1	2	3	4	5	(42)
(13)	1	2	3	4	5	I consult with faculty on curricular improvement.	1	2	3	4	5	(43)
(14)	1	2	3	4	5	I consult with faculty on instructional design.	1	2	3	4	5	(44)
(15)	1	2	3	4	5	I support faculty in new ways of teaching and learning.	1	2	3	4	5	(45)
(16)	1	2	3	4	5	I create online course materials for faculty (Influence curricular decisions).	1	2	3	4	5	(46)
(17)	1	2	3	4	5	I create vision and mission statements that match the instructional goals of my institution.	1	2	3	4	5	(47)

	DOES PERFORM never				always		SHOULD PERFORM never				always	
(18)	1	2	3	4	5	I participate in the design and standardization of technology classrooms to meet different teaching styles and faculty needs.	1	2	3	4	5	(48)
(19)	1	2	3	4	5	I articulate academic technology objectives to upper management.	1	2	3	4	5	(49)
(20)	1	2	3	4	5	I act as a liaison between upper management and faculty on issues surrounding instructional technology.	1	2	3	4	5	(50)
(21)	1	2	3	4	5	I plan for long term installation and upgrades of technology in classrooms.	1	2	3	4	5	(51)
(22)	1	2	3	4	5	I lead efforts to identify and evaluate next generation learning technologies.	1	2	3	4	5	(52)
(23)	1	2	3	4	5	I recommend the purchase and use of learning technologies.	1	2	3	4	5	(53)
(24)	1	2	3	4	5	I investigate and communicate issues relating to changes in instructional technology and faculty expectations to administrators.	1	2	3	4	5	(54)
(25)	1	2	3	4	5	I investigate and communicate issues relating to changes in instructional technology and student expectations to administrators.	1	2	3	4	5	(55)
(26)	1	2	3	4	5	I attend professional development or training workshops for existing technologies.	1	2	3	4	5	(56)
(27)	1	2	3	4	5	I attend professional development or training workshops for new technologies.	1	2	3	4	5	(57)
(28)	1	2	3	4	5	I attend professional development workshops in educational technology.	1	2	3	4	5	(58)

	DOES PERFORM never → always						SHOULD PERFORM never → always					
(29)	1	2	3	4	5	I manage a staff of Academic Technology professionals.	1	2	3	4	5	(59)
(30)	1	2	3	4	5	I influence strategic technology decisions.	1	2	3	4	5	(60)
(31)	1	2	3	4	5	I participate in academic technology strategic planning.	1	2	3	4	5	(61)
(32)	1	2	3	4	5	I teach education/ academic technology courses at my institution.	1	2	3	4	5	(62)
(33)	1	2	3	4	5	I participate in meetings that impact learning technology at my institution.	1	2	3	4	5	(63)

Please rate these questions to the following scale:
1 = Strongly disagree, 2 = Disagree, 3 = Neither agree nor disagree, 4 = Agree, 5 = Strongly agree
Please circle your choice in both columns for each item.

	DOES PERFORM agree → disagree						SHOULD PERFORM agree → disagree					
(34)	1	2	3	4	5	I have the opportunity to express my perspective or make recommendations for a particular cause of action.	1	2	3	4	5	(64)
(35)	1	2	3	4	5	I believe my recommendations effect the decision making process at my institution.	1	2	3	4	5	(65)
(36)	1	2	3	4	5	I believe learning technologies are effectively used at my institution.	1	2	3	4	5	(66)
(37)	1	2	3	4	5	In my opinion, my superiors believe that learning technologies are effectively used at my institution.	1	2	3	4	5	(67)

APPENDIX E
Email Invitation to Participate in Survey

Hello,

My name is Stephanie Glick, and I am a doctoral student in Educational Technology at Pepperdine University, Graduate School of Education and Psychology. I am currently in the process of recruiting individuals for my study entitled, ñExploring the Influence of Academic Technology Professionals in Higher Education.ò The study is designed to identify perceived gaps in responsibilities and influence which Academic Technology professionals currently have on college campuses. To this end, I am inviting individuals who identify themselves as Academic Technology professionals to participate in my study. I hope you will voluntarily agree to participate in my study.

I hope that you will choose to participate as I am confident, that with your help, the data garnered by this study will help to clarify roles and expectations and thereby improve the field. Further, this study will assist those who want to work, and institutions that want to hire people to work, in the field of Academic Technology.

The survey will be available for two weeks, May 16 - 30, 2013.

The survey link is https://novisurvey.net/n/AcTech.aspx

Thank you,
Stephanie Glick
Pepperdine University
6100 Center Drive
Los Angeles, CA 90045
Stephanie.Glick@pepperdine.edu<mailto:Stephanie.Glick@pepperdine.edu>

APPENDIX F
Text of Consent Screen

Dear Participant:

My name is Stephanie Glick, and I am a doctoral student in Educational Technology at Pepperdine University, Graduate School of Education and Psychology. I am currently in the process of recruiting individuals for my study entitled, ñExploring the Influence of Academic Technology Professionals in Higher Education.ò The study is designed to identify perceived gaps in responsibilities and influence Academic Technology professionals currently have on college campuses. To this end, I am inviting individuals who identify themselves as Academic Technology professionals to participate in my study. I hope you will voluntarily agree to participate in my study.

The following is a description of what your study participation entails, the terms for participating in the study, and a discussion of your rights as a study participant. Please read this information carefully before deciding whether or not you wish to participate. If you decide to participate in the study, you will be asked to complete an online survey. It should take approximates 15 minutes to complete the survey that you have been asked to complete.

The potential benefits to you for participating in the study are identifying and understanding the various Academic Technology roles in higher education, job title, competencies and responsibilities of these positions. The results of this study should help to clarify roles and expectations and thereby improve the field. Further, this study will assist those who want to work, and institutions that want to hire people to work, in the field of Academic Technology.

Participation is this study is entirely voluntary. The study focuses on your professional roles, responsibilities and tasks. This is an educational research study and, while there is

minimal risk you may encounter a feeling of frustration taking the survey or answering questions and a feeling that you have ñwasted time.ò I can assure you that all possible and reasonable measures are being taken to avoid these risks.

If you should decide to participate and find you are not interested in completing the survey in its entirely, you have the right to discontinue at any point without being questioned about your decision. You also do not have to answer any of the questions on the survey that you prefer not to answer--just leave such items blank.

After 10 days, a reminder note will be sent to you to complete and return the survey. Since this note will go out to everyone, I apologize ahead of time for sending you these reminders if you have completed the survey.

If the findings of the study are presented to professional audiences or published, no information that identifies you personally will be released. The data will be kept in a secure manner for at least three at which time the data will be destroyed.

If you have any questions regarding the information that I have provided above, please do not hesitate to contact me at the address and phone number provided below. If you have further questions or do not feel I have adequately addressed your concerns, please contact Dr. Paul Sparks (paul.sparks@pepperdine.edu). If you have questions about your rights as a research participant, contact:

Doug Leigh, Ph.D., Chair, Graduate and Professional Schools IRB
Pepperdine University, Graduate School of Education & Psychology
6100 Center Drive, 5th Floor
Los Angeles, CA 90045
Dough.Leigh@pepperdine.edu
W: 310-568-2389
F: 310-568-5755

By completing the survey you are acknowledging that you have read and understand what your study participation entails, and are consenting to participate in the study.

Thank you for taking the time to read this information, and I hope you decide to complete the survey.

Sincerely,

Stephanie Glick
Doctoral Student
Stephanie.Glick@Pepperdine.edu

APPENDIX G
Respondent Characteristics

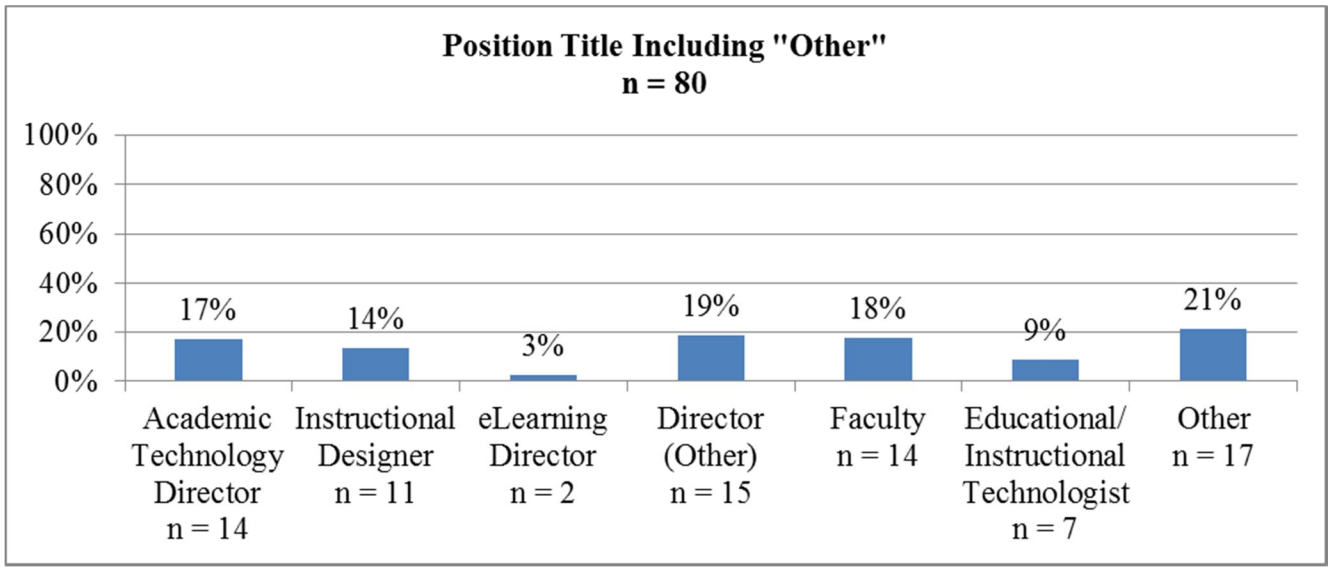

Figure 13. Position title including "other"

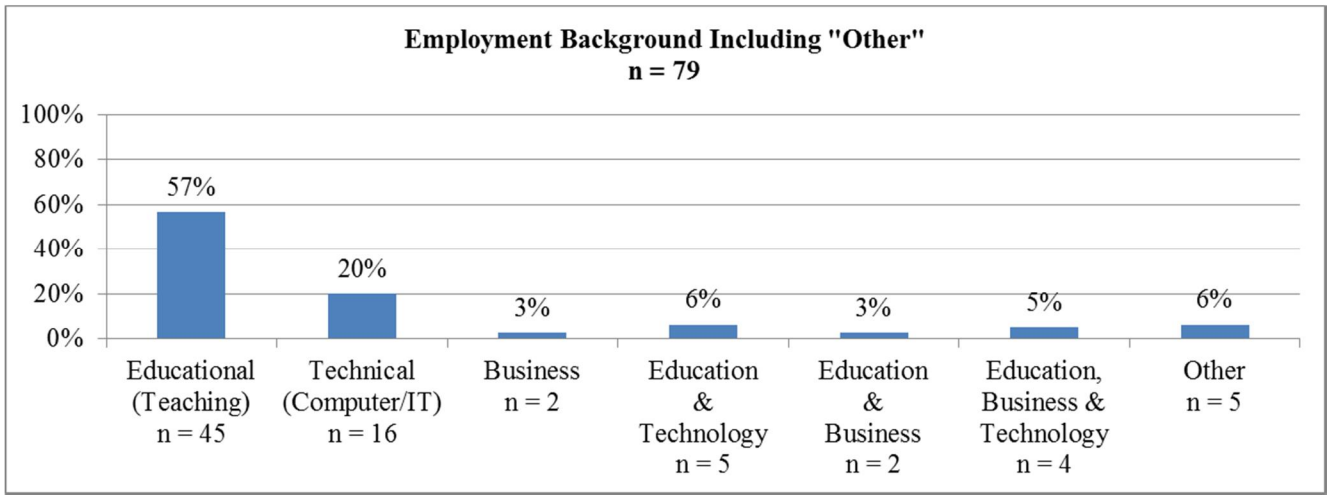

Figure 14. Employment background including "other"

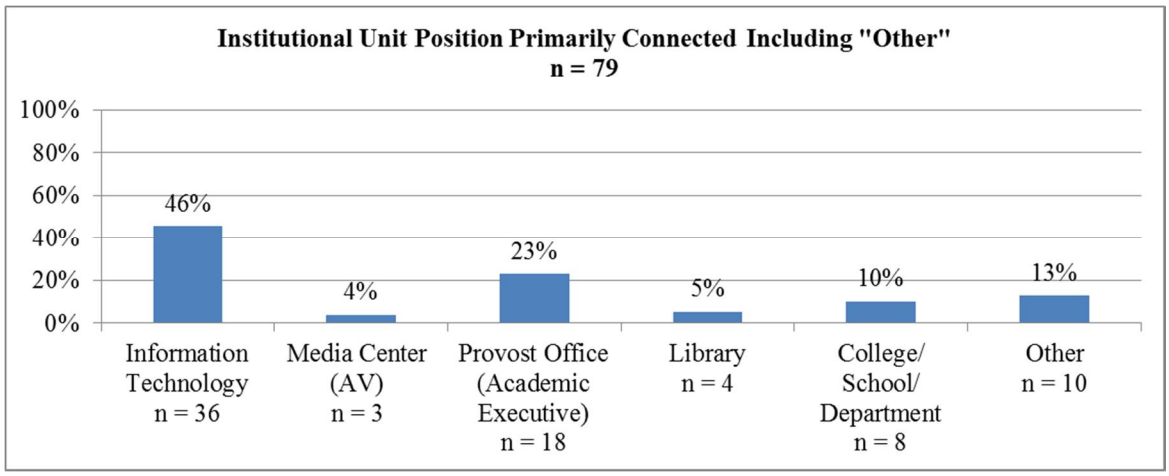

Figure 15. Institutional unit connected to ... including "other"

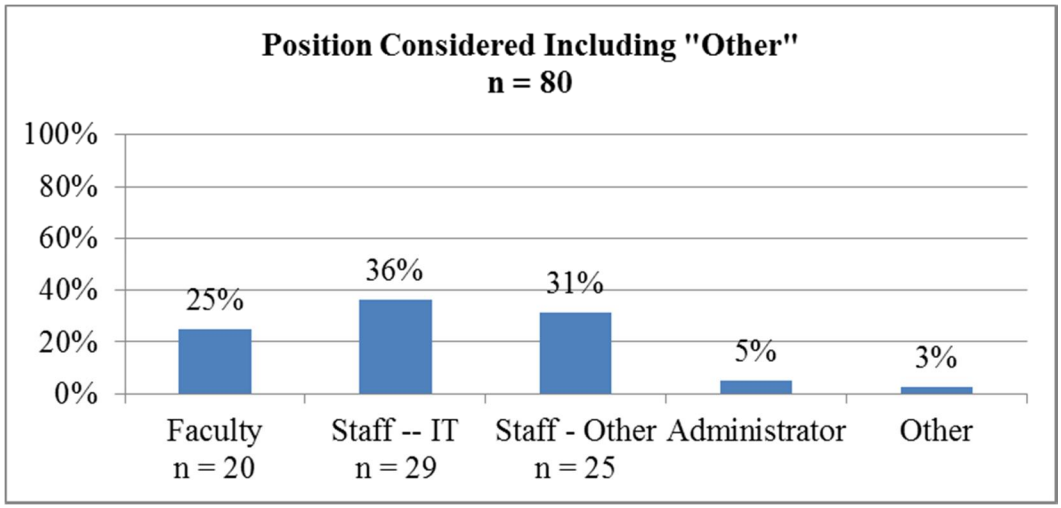

Figure 16. Position considered including "other"

APPENDIX H
Factor Analysis Reports

Table 22
RQ1: Factor Loadings Report

Factor Loadings Report					
Variables	**Factor1**	**Factor2**	**Factor3**	**Factor4**	**Factor5**
X11_D	-0.643667	0.008953	-0.141246	0.412342	0.272059
X17_D	-0.303987	-0.130036	0.046929	0.467683	0.14743
X19_D	-0.736521	-0.065261	-0.099929	-0.010796	0.14672
X20_D	-0.731985	-0.15071	-0.006288	0.065732	0.225102
X21_D	-0.328046	-0.057128	-0.180062	0.702435	0.175315
X23_D	-0.57089	-0.165124	-0.275416	0.399238	0.045664
X29_D	-0.662939	0.06139	0.103716	0.29008	-0.174794
X30_D	-0.826362	-0.019159	-0.020015	0.389833	-0.109984
X31_D	-0.757474	-0.001491	-0.118649	0.331405	-0.061467
X8_D	0.125128	-0.68502	-0.077018	-0.009616	-0.064124
X9_D	-0.277499	-0.761968	-0.236643	-0.126614	0.197662
X13_D	-0.112741	-0.541324	-0.034108	0.08345	0.47934
X14_D	-0.323571	-0.728904	-0.096874	-0.05862	0.297107
X16_D	0.037756	-0.71887	-0.046518	0.047419	0.011959
X26_D	-0.08566	-0.088202	-0.602511	0.024831	-0.057058
X27_D	-0.135288	-0.144612	-0.818586	0.064185	-0.014345
X28_D	-0.165135	-0.13191	-0.745524	0.086126	0.172914
X18_D	-0.189693	0.048317	-0.174877	0.741857	0.343359
X32_D	0.436462	-0.311952	-0.061141	0.417252	0.370607
X12_D	-0.151657	-0.189521	-0.047424	0.107877	0.601879
X24_D	-0.686337	-0.119528	-0.041898	0.175651	0.534992
X25_D	-0.608336	-0.086863	-0.213215	0.056065	0.545109
X10_D	-0.056759	-0.002513	0.427195	0.361309	-0.190241
X15_D	-0.192551	-0.200714	0.299535	0.14595	-0.284792
X22_D	-0.187197	0.155863	0.191706	0.477276	-0.188155
X33_D	-0.197449	0.15065	0.369283	0.470876	-0.229878

Table 23
Factor Analysis after Varimax Rotation

Factor Structure Summary after Varimax Rotation				
Factor1	**Factor2**	**Factor3**	**Factor4**	**Factor5**
X30_D	X9_D	X27_D	X18_D	X12_D
X31_D	X14_D	X28_D	X21_D	X25_D
X19_D	X16_D	X26_D		X24_D
X20_D	X8_D			
X24_D	X13_D			
X29_D				
X11_D				
X25_D				
X23_D				

Table 24
RQ1: Correlation Table

Correlation Section

Variables	X11_D	X17_D	X19_D	X20_D	X21_D	X23_D	X29_D
X11_D	1	0.43446	0.465134	0.565736	0.574732	0.666583	0.513732
X17_D	0.43446	1	0.200574	0.313843	0.369491	0.387363	0.400783
X19_D	0.465134	0.20057	1	0.60908	0.284656	0.402593	0.363922
X20_D	0.565736	0.31384	0.60908	1	0.360048	0.541505	0.400605
X21_D	0.574732	0.36949	0.284656	0.360048	1	0.585295	0.357169
X23_D	0.666583	0.38736	0.402593	0.541505	0.585295	1	0.49182
X29_D	0.513732	0.40078	0.363922	0.400605	0.357169	0.49182	1
X30_D	0.634111	0.4641	0.594828	0.578157	0.51367	0.610327	0.737593
X31_D	0.663618	0.46364	0.58408	0.4695	0.412075	0.528537	0.624026
X8_D	-0.04467	0.12208	-0.0322	-0.00054	0.019339	0.140182	-0.14882
X9_D	0.173395	0.14096	0.333159	0.367758	0.184715	0.271208	0.023963
X13_D	0.223708	0.20563	0.132531	0.320788	0.168791	0.140532	0.051976
X14_D	0.282259	0.16307	0.25909	0.405477	0.141444	0.30414	0.130006
X16_D	-0.05945	0.03147	0.073945	0.057143	0.147363	0.200994	-0.06315
X26_D	0.07139	-0.03609	0.303814	0.06544	0.162911	0.141519	-0.05501
X27_D	0.201995	0.00577	0.139384	0.145539	0.211657	0.346847	0.013894
X28_D	0.325275	0.15554	0.157286	0.200486	0.193893	0.391638	0.043672
X18_D	0.545701	0.37296	0.265634	0.19576	0.805174	0.467815	0.214269
X32_D	-0.01436	0.29267	-0.2671	-0.18044	0.16806	-0.03283	-0.31218
X12_D	0.346606	0.23485	0.289578	0.236286	0.166271	0.090384	0.008606
X24_D	0.626208	0.37132	0.605559	0.691579	0.483814	0.564219	0.364982
X25_D	0.595605	0.25597	0.622095	0.586893	0.414718	0.485416	0.255981
X10_D	0.080896	0.07763	0.004047	-0.00139	0.143751	0.123637	0.214957
X15_D	0.10744	0.07446	0.170423	0.102497	-0.00446	-0.01842	0.118958
X22_D	0.206138	0.18338	0.097129	0.16843	0.322415	0.100812	0.256017
X33_D	0.129227	0.3054	0.040877	0.178849	0.277251	0.133691	0.389469

Correlation Section

Variables	X30_D	X31_D	X8_D	X9_D	X13_D	X14_D	X16_D
X11_D	0.634111	0.663618	-0.04467	0.173395	0.223708	0.282259	-0.05945
X17_D	0.464099	0.463638	0.122082	0.140957	0.205625	0.163065	0.031473
X19_D	0.594828	0.58408	-0.0322	0.333159	0.132531	0.25909	0.073945
X20_D	0.578157	0.4695	-0.00054	0.367758	0.320788	0.405477	0.057143
X21_D	0.51367	0.412075	0.019339	0.184715	0.168791	0.141444	0.147363
X23_D	0.610327	0.528537	0.140182	0.271208	0.140532	0.30414	0.200994
X29_D	0.737593	0.624026	-0.14882	0.023963	0.051976	0.130006	-0.06315
X30_D	1	0.836567	-0.14301	0.162347	0.119036	0.25837	-0.00924
X31_D	0.836567	1	-0.11573	0.161083	0.091969	0.280203	-0.05735
X8_D	-0.14301	-0.11573	1	0.503506	0.203367	0.419748	0.55256
X9_D	0.162347	0.161083	0.503506	1	0.505205	0.73092	0.561038
X13_D	0.119036	0.091969	0.203367	0.505205	1	0.691192	0.399488
X14_D	0.25837	0.280203	0.419748	0.73092	0.691192	1	0.458724
X16_D	-0.00924	-0.05735	0.55256	0.561038	0.399488	0.458724	1
X26_D	0.095275	0.196318	0.042126	0.22687	0.11189	0.075031	0.108361
X27_D	0.176187	0.212083	0.118759	0.320119	0.167415	0.286564	0.103751
X28_D	0.164991	0.244976	0.11462	0.359214	0.192391	0.308877	0.067128
X18_D	0.359431	0.376692	-0.10528	0.045094	0.23191	0.066657	0.07955
X32_D	-0.14747	-0.16664	0.254529	0.125702	0.36957	0.171651	0.225195
X12_D	0.068572	0.205152	0.039947	0.307559	0.449434	0.417459	0.087532
X24_D	0.547903	0.478224	-0.06549	0.424178	0.408444	0.445975	0.0872
X25_D	0.497559	0.459158	0.03289	0.366223	0.315663	0.381876	0.131631
X10_D	0.205883	0.093607	-0.04948	-0.20717	-0.04119	-0.06168	0.024437
X15_D	0.220425	0.2618	0.08731	0.118958	-0.00481	0.088165	0.129844
X22_D	0.295949	0.30078	-0.22617	-0.19869	-0.07163	-0.15772	-0.15569
X33_D	0.381707	0.225614	-0.11585	-0.25933	-0.18345	-0.16609	-0.15478

Correlation Section

Variables	X26_D	X27_D	X28_D	X18_D	X32_D	X12_D	X24_D
X11_D	0.07139	0.201995	0.325275	0.545701	-0.01436	0.346606	0.626208
X17_D	-0.03609	0.005768	0.155537	0.372962	0.292668	0.234845	0.371319
X19_D	0.303814	0.139384	0.157286	0.265634	-0.2671	0.289578	0.605559
X20_D	0.06544	0.145539	0.200486	0.19576	-0.18044	0.236286	0.691579
X21_D	0.162911	0.211657	0.193893	0.805174	0.16806	0.166271	0.483814
X23_D	0.141519	0.346847	0.391638	0.467815	-0.03283	0.090384	0.564219
X29_D	-0.05501	0.013894	0.043672	0.214269	-0.31218	0.008606	0.364982
X30_D	0.095275	0.176187	0.164991	0.359431	-0.14747	0.068572	0.547903
X31_D	0.196318	0.212083	0.244976	0.376692	-0.16664	0.205152	0.478224
X8_D	0.042126	0.118759	0.11462	-0.10528	0.254529	0.039947	-0.06549
X9_D	0.22687	0.320119	0.359214	0.045094	0.125702	0.307559	0.424178
X13_D	0.11189	0.167415	0.192391	0.23191	0.36957	0.449434	0.408444
X14_D	0.075031	0.286564	0.308877	0.066657	0.171651	0.417459	0.445975
X16_D	0.108361	0.103751	0.067128	0.07955	0.225195	0.087532	0.0872
X26_D	1	0.542093	0.432753	0.185939	0.04797	0.073922	0.056664
X27_D	0.542093	1	0.709585	0.139951	0.071009	0.085564	0.163468
X28_D	0.432753	0.709585	1	0.244669	0.153731	0.229932	0.267383
X18_D	0.185939	0.139951	0.244669	1	0.272557	0.3122	0.468078
X32_D	0.04797	0.071009	0.153731	0.272557	1	0.335897	-0.03427
X12_D	0.073922	0.085564	0.229932	0.3122	0.335897	1	0.440634
X24_D	0.056664	0.163468	0.267383	0.468078	-0.03427	0.440634	1
X25_D	0.084885	0.271849	0.34654	0.393392	0.012194	0.415509	0.780433
X10_D	-0.28985	-0.26208	-0.3577	0.125366	0.086068	-0.18257	0.033268
X15_D	0.001247	-0.22513	-0.20224	0.040237	-0.10151	-0.00525	0.003736
X22_D	-0.12317	0.048742	-0.09176	0.294871	-0.01067	-0.00602	0.105667
X33_D	-0.13543	-0.28692	-0.22574	0.238753	-0.03729	-0.03851	0.085804

Correlation Section

Variables	X25_D	X10_D	X15_D	X22_D	X33_D
X11_D	0.595605	0.080896	0.10744	0.206138	0.129227
X17_D	0.25597	0.077631	0.074457	0.183379	0.305397
X19_D	0.622095	0.004047	0.170423	0.097129	0.040877
X20_D	0.586893	-0.00139	0.102497	0.16843	0.178849
X21_D	0.414718	0.143751	-0.00446	0.322415	0.277251
X23_D	0.485416	0.123637	-0.01842	0.100812	0.133691
X29_D	0.255981	0.214957	0.118958	0.256017	0.389469
X30_D	0.497559	0.205883	0.220425	0.295949	0.381707
X31_D	0.459158	0.093607	0.2618	0.30078	0.225614
X8_D	0.03289	-0.04948	0.08731	-0.22617	-0.11585
X9_D	0.366223	-0.20717	0.118958	-0.19869	-0.25933
X13_D	0.315663	-0.04119	-0.00481	-0.07163	-0.18345
X14_D	0.381876	-0.06168	0.088165	-0.15772	-0.16609
X16_D	0.131631	0.024437	0.129844	-0.15569	-0.15478
X26_D	0.084885	-0.28985	0.001247	-0.12317	-0.13543
X27_D	0.271849	-0.26208	-0.22513	0.048742	-0.28692
X28_D	0.34654	-0.3577	-0.20224	-0.09176	-0.22574
X18_D	0.393392	0.125366	0.040237	0.294871	0.238753
X32_D	0.012194	0.086068	-0.10151	-0.01067	-0.03729
X12_D	0.415509	-0.18257	-0.00525	-0.00602	-0.03851
X24_D	0.780433	0.033268	0.003736	0.105667	0.085804
X25_D	1	-0.12536	-0.13785	-0.02886	-0.11602
X10_D	-0.12536	1	0.188902	0.38074	0.35242
X15_D	-0.13785	0.188902	1	0.401516	0.259111
X22_D	-0.02886	0.38074	0.401516	1	0.420172
X33_D	-0.11602	0.35242	0.259111	0.420172	1

APPENDIX I
RQ 4: ANOVA Tables

Table 25

RQ 4 - Gap 1 Strategic Performance: Institution Type ANOVA Table

Analysis of Variance Table						
Source		Sum of	Mean		Prob	Power
Term	DF	Squares	Square	F-Ratio	Level	(Alpha=0.05)
A: inst_type	3	3.710266	1.236755	0.41	0.749534	0.126903
S	74	225.7393	3.050531			
Total (Adjusted)	77	229.4495				
Total	78					

Table 26

RQ 4 - Gap 1 Strategic Performance: Official Title ANOVA Table

Analysis of Variance Table						
Source		Sum of	Mean		Prob	Power
Term	DF	Squares	Square	F-Ratio	Level	(Alpha=0.05)
A: title	3	41.29947	13.76649	5.41	0.002013*	0.92432
S	74	188.1501	2.542568			
Total (Adjusted)	77	229.4495				
Total	78					
* Term significant at alpha = 0.05						

Table 27

RQ 4 - Gap 1 Strategic Performance: Highest Level of Education ANOVA Table

Analysis of Variance Table						
Source		Sum of	Mean		Prob	Power
Term	DF	Squares	Square	F-Ratio	Level	(Alpha=0.05)
A: education_	2	6.39326	3.19663	1.08	0.343599	0.233501
S	76	224.234	2.950448			
Total (Adjusted)	78	230.6273				
Total	79					

Table 28

RQ 4 - Gap 1 Strategic Performance: Employment Background ANOVA Table

Analysis of Variance Table						
Source		Sum of	Mean		Prob	Power
Term	DF	Squares	Square	F-Ratio	Level	(Alpha=0.05)
A: emp_back	3	18.03574	6.011913	2.08	0.109679	0.51268
S	73	210.5603	2.884387			
Total (Adjusted)	76	228.596				
Total	77					

Table 29
RQ 4 - Gap 1 Strategic Performance: Unit Connected to ANOVA Table

Analysis of Variance Table						
Source		**Sum of**	**Mean**		**Prob**	**Power**
Term	**DF**	**Squares**	**Square**	**F-Ratio**	**Level**	**(Alpha=0.05)**
A: connected	3	2.841304	0.947101	0.31	0.818603	0.107143
S	74	226.6082	3.062274			
Total (Adjusted)	77	229.4495				
Total	78					
* Term significant at alpha = 0.05						

Table 30
RQ 4 - Gap 1 Strategic Performance: Years in Current Position ANOVA Table

Analysis of Variance Table						
Source		**Sum of**	**Mean**		**Prob**	**Power**
Term	**DF**	**Squares**	**Square**	**F-Ratio**	**Level**	**(Alpha=0.05)**
A: How_long	2	10.07268	5.036341	1.72	0.185732	0.350937
S	75	219.3769	2.925025			
Total (Adjusted)	77	229.4495				
Total	78					

Table 31
RQ4 - Gap 1 Strategic Performance: Position Considered ANOVA Table

Analysis of Variance Table						
Source		**Sum of**	**Mean**		**Prob**	**Power**
Term	**DF**	**Squares**	**Square**	**F-Ratio**	**Level**	**(Alpha=0.05)**
A: I_am	3	11.69543	3.898475	1.32	0.272766	0.339406
S	74	217.7541	2.942623			
Total (Adjusted)	77	229.4495				
Total	78					
* Term significant at alpha = 0.05						

Table 32
RQ 4 - Gap 2 Instructional Design: Institution Type ANOVA Table

Analysis of Variance Table						
Source		**Sum of**	**Mean**		**Prob**	**Power**
Term	**DF**	**Squares**	**Square**	**F-Ratio**	**Level**	**(Alpha=0.05)**
A: inst_type	3	6.652715	2.217572	0.98	0.405295	0.258029
S	75	169.1346	2.255128			
Total (Adjusted)	78	175.7873				
Total	79					
* Term significant at alpha = 0.05						

Table 33
RQ 4 - Gap 2 Instructional Design: Official Title ANOVA Table

Analysis of Variance Table						
Source		Sum of	Mean		Prob	Power
Term	DF	Squares	Square	F-Ratio	Level	(Alpha=0.05)
A: title	3	22.48548	7.495161	3.67	0.015943*	0.780789
S	75	153.3019	2.044025			
Total (Adjusted)	78	175.7873				
Total	79					
* Term significant at alpha = 0.05						

Table 34
RQ 4 - Gap 2 Instructional Design: Highest Level of Education ANOVA Table

Analysis of Variance Table						
Source		Sum of	Mean		Prob	Power
Term	DF	Squares	Square	F-Ratio	Level	(Alpha=0.05)
A: education_	2	2.231635	1.115817	0.48	0.620931	0.12584
S	77	179.1839	2.327063			
Total (Adjusted)	79	181.4155				
Total	80					

Table 35
RQ 4 - Gap 2 Instructional Design: Employment Background ANOVA Table

Analysis of Variance Table						
Source		Sum of	Mean		Prob	Power
Term	DF	Squares	Square	F-Ratio	Level	(Alpha=0.05)
A: emp_back	3	15.46318	5.154392	2.41	0.073843	0.579589
S	74	158.3748	2.1402			
Total (Adjusted)	77	173.838				
Total	78					
* Term significant at alpha = 0.05						

Table 36
RQ 4 - Gap 2 Instructional Design: Unit Connected to ANOVA Table

Analysis of Variance Table						
Source		Sum of	Mean		Prob	Power
Term	DF	Squares	Square	F-Ratio	Level	(Alpha=0.05)
A: connected	3	0.5978333	0.1992778	0.09	0.967391	0.064809
S	74	171.0868	2.311984			
Total (Adjusted)	77	171.6846				
Total	78					
* Term significant at alpha = 0.05						

Table 37
RQ 4 - Gap 2 Instructional Design: Years in Current Position ANOVA Table

Analysis of Variance Table						
Source		Sum of	Mean		Prob	Power
Term	DF	Squares	Square	F-Ratio	Level	(Alpha=0.05)
A: How_long	2	5.793441	2.896721	1.3	0.279858	0.272556
S	76	169.9939	2.236762			
Total (Adjusted)	78	175.7873				
Total	79					
* Term significant at alpha = 0.05						

Table 38
RQ4 - Gap 2 Instructional Design: Position Considered ANOVA Table

Analysis of Variance Table						
Source		**Sum of**	**Mean**		**Prob**	**Power**
Term	**DF**	**Squares**	**Square**	**F-Ratio**	**Level**	**(Alpha=0.05)**
A: I_am	3	9.509192	3.169731	1.43	0.240812	0.364583
S	75	166.2782	2.217042			
Total (Adjusted)	78	175.7873				
Total	79					
* Term significant at alpha = 0.05						

Table 39
RQ 4 - Gap 3 Ongoing Personal Professional Development: Institution Type ANOVA Table

Analysis of Variance Table						
Source		**Sum of**	**Mean**		**Prob**	**Power**
Term	**DF**	**Squares**	**Square**	**F-Ratio**	**Level**	**(Alpha=0.05)**
A: inst_type	3	6.702287	2.234096	0.52	0.669513	0.151454
S	73	313.3316	4.292214			
Total (Adjusted)	76	320.0339				
Total	77					
* Term significant at alpha = 0.05						

Table 40
RQ 4 - Gap 3 Ongoing Personal Professional Development: Official Title ANOVA Table

Analysis of Variance Table						
Source		**Sum of**	**Mean**		**Prob**	**Power**
Term	**DF**	**Squares**	**Square**	**F-Ratio**	**Level**	**(Alpha=0.05)**
A: title	3	40.62545	13.54182	3.54	0.018766*	0.763831
S	73	279.4084	3.827513			
Total (Adjusted)	76	320.0339				
Total	77					
* Term significant at alpha = 0.05						

Table 41
RQ 4 - Gap 3 Ongoing Personal Professional Development: Highest Level of Education ANOVA Table

Analysis of Variance Table						
Source		**Sum of**	**Mean**		**Prob**	**Power**
Term	**DF**	**Squares**	**Square**	**F-Ratio**	**Level**	**(Alpha=0.05)**
A: education_	2	23.54527	11.77264	2.96	0.057957	0.5597
S	75	298.3949	3.978599			
Total (Adjusted)	77	321.9402				
Total	78					
* Term significant at alpha = 0.05						

Table 42

RQ 4 - Gap 3 Ongoing Personal Professional Development: Employment Background ANOVA Table

Analysis of Variance Table						
Source		**Sum of**	**Mean**		**Prob**	**Power**
Term	**DF**	**Squares**	**Square**	**F-Ratio**	**Level**	**(Alpha=0.05)**
A: emp_back	3	23.08251	7.69417	1.87	0.142509	0.465251
S	72	296.4219	4.116971			
Total (Adjusted)	75	319.5044				
Total	76					
* Term significant at alpha = 0.05						

Table 43

RQ 4 - Gap 3 Ongoing Personal Professional Development: Unit Connected to ANOVA Table

Analysis of Variance Table						
Source		**Sum of**	**Mean**		**Prob**	**Power**
Term	**DF**	**Squares**	**Square**	**F-Ratio**	**Level**	**(Alpha=0.05)**
A: connected	3	3.300843	1.100281	0.25	0.858537	0.09605
S	73	316.7331	4.338809			
Total (Adjusted)	76	320.0339				
Total	77					
* Term significant at alpha = 0.05						

Table 44

RQ 4 - Gap 3 Ongoing Personal Professional Development: Years in Current Position ANOVA Table

Analysis of Variance Table						
Source		**Sum of**	**Mean**		**Prob**	**Power**
Term	**DF**	**Squares**	**Square**	**F-Ratio**	**Level**	**(Alpha=0.05)**
A: How_long	2	8.716234	4.358117	1.04	0.359988	0.224572
S	74	311.3177	4.206995			
Total (Adjusted)	76	320.0339				
Total	77					
* Term significant at alpha = 0.05						

Table 45

RQ4 - Gap 3 Ongoing Personal Professional Development: Position Considered ANOVA Table

Analysis of Variance Table						
Source		**Sum of**	**Mean**		**Prob**	**Power**
Term	**DF**	**Squares**	**Square**	**F-Ratio**	**Level**	**(Alpha=0.05)**
A: I_am	3	16.49636	5.498787	1.32	0.273649	0.338612
S	73	303.5375	4.158049			
Total (Adjusted)	76	320.0339				
Total	77					
* Term significant at alpha = 0.05						

Table 46
RQ 4 - Gap 4 Academic Technology Management: Institution Type ANOVA Table

Analysis of Variance Table						
Source		**Sum of**	**Mean**		**Prob**	**Power**
Term	**DF**	**Squares**	**Square**	**F-Ratio**	**Level**	**(Alpha=0.05)**
A: inst_type	3	0.6480442	0.2160147	0.08	0.971606	0.063409
S	75	207.1283	2.761711			
Total (Adjusted)	78	207.7764				
Total	79					
* Term significant at alpha = 0.05						

Table 47
RQ 4 – Gap 4 Academic Technology Management: Official Title ANOVA Table

Analysis of Variance Table						
Source		**Sum of**	**Mean**		**Prob**	**Power**
Term	**DF**	**Squares**	**Square**	**F-Ratio**	**Level**	**(Alpha=0.05)**
A: title	3	31.21861	10.4062	4.42	0.006450*	0.858769
S	75	176.5578	2.354104			
Total (Adjusted)	78	207.7764				
Total	79					
* Term significant at alpha = 0.05						

Table 48
Gap 4 Academic Technology Management: Highest Level of Education ANOVA Table

Analysis of Variance Table						
Source		**Sum of**	**Mean**		**Prob**	**Power**
Term	**DF**	**Squares**	**Square**	**F-Ratio**	**Level**	**(Alpha=0.05)**
A: education_	2	0.3920729	0.1960365	0.07	0.930084	0.060632
S	77	208.0631	2.702119			
Total (Adjusted)	79	208.4552				
Total	80					
* Term significant at alpha = 0.05						

Table 49
RQ 4 - Gap 4 Academic Technology Management: Employment Background ANOVA Table

Analysis of Variance Table						
Source		**Sum of**	**Mean**		**Prob**	**Power**
Term	**DF**	**Squares**	**Square**	**F-Ratio**	**Level**	**(Alpha=0.05)**
A: emp_back	3	19.84976	6.616587	2.64	0.055618	0.623777
S	74	185.401	2.505419			
Total (Adjusted)	77	205.2508				
Total	78					
* Term significant at alpha = 0.05						

Table 50
RQ 4 - Gap 4 Academic Technology Management: Unit Connected to ANOVA Table

Analysis of Variance Table						
Source		**Sum of**	**Mean**		**Prob**	**Power**
Term	**DF**	**Squares**	**Square**	**F-Ratio**	**Level**	**(Alpha=0.05)**
A: connected	3	1.966697	0.6555655	0.24	0.870073	0.09291
S	74	204.4211	2.762448			
Total (Adjusted)	77	206.3878				
Total	78					
* Term significant at alpha = 0.05						

Table 51
RQ 4 - Gap 4 Academic Technology Management: Years in Current Position ANOVA Table

Analysis of Variance Table						
Source		**Sum of**	**Mean**		**Prob**	**Power**
Term	**DF**	**Squares**	**Square**	**F-Ratio**	**Level**	**(Alpha=0.05)**
A: How_long	2	3.396197	1.698098	0.63	0.534588	0.152012
S	76	204.3802	2.689213			
Total (Adjusted)	78	207.7764				
Total	79					
* Term significant at alpha = 0.05						

Table 52
RQ4 - Gap 4 Academic Technology Management: Position Considered ANOVA Table

Analysis of Variance Table						
Source		**Sum of**	**Mean**		**Prob**	**Power**
Term	**DF**	**Squares**	**Square**	**F-Ratio**	**Level**	**(Alpha=0.05)**
A: I_am	3	5.982851	1.994284	0.74	0.530808	0.201241
S	75	201.7935	2.69058			
Total (Adjusted)	78	207.7764				
Total	79					
* Term significant at alpha = 0.05						

Table 53
RQ 5 - Gap 5 Research and Assessment: Institution Type ANOVA Table

Analysis of Variance Table						
Source		**Sum of**	**Mean**		**Prob**	**Power**
Term	**DF**	**Squares**	**Square**	**F-Ratio**	**Level**	**(Alpha=0.05)**
A: inst_type	3	2.589795	0.8632652	0.31	0.817412	0.107476
S	74	205.4515	2.776372			
Total (Adjusted)	77	208.0413				
Total	78					
* Term significant at alpha = 0.05						

Table 54
RQ 5 - Gap 5 Research and Assessment: Official Title ANOVA Table

Analysis of Variance Table						
Source		**Sum of**	**Mean**		**Prob**	**Power**
Term	**DF**	**Squares**	**Square**	**F-Ratio**	**Level**	**(Alpha=0.05)**
A: title	3	29.05075	9.683582	4	0.010674*	0.818832
S	74	178.9906	2.418791			
Total (Adjusted)	77	208.0413				
Total	78					
* Term significant at alpha = 0.05						

Table 55
RQ 5 - Gap 5 Research and Assessment: Highest Level of Education ANOVA Table

Analysis of Variance Table						
Source		**Sum of**	**Mean**		**Prob**	**Power**
Term	**DF**	**Squares**	**Square**	**F-Ratio**	**Level**	**(Alpha=0.05)**
A: education_	2	1.609287	0.8046433	0.3	0.744645	0.095369
S	76	206.6017	2.718443			
Total (Adjusted)	78	208.211				
Total	79					
* Term significant at alpha = 0.05						

Table 56
RQ 5 - Gap 5 Research and Assessment: Employment Background ANOVA Table

Analysis of Variance Table						
Source		**Sum of**	**Mean**		**Prob**	**Power**
Term	**DF**	**Squares**	**Square**	**F-Ratio**	**Level**	**(Alpha=0.05)**
A: emp_back	3	16.61191	5.537305	2.11	0.105855	0.518908
S	73	191.2553	2.619936			
Total (Adjusted)	76	207.8672				
Total	77					
* Term significant at alpha = 0.05						

Table 57
RQ 5 - Gap 5 Research and Assessment: Unit Connected to ANOVA Table

Analysis of Variance Table						
Source		**Sum of**	**Mean**		**Prob**	**Power**
Term	**DF**	**Squares**	**Square**	**F-Ratio**	**Level**	**(Alpha=0.05)**
A: connected	3	3.118479	1.039493	0.38	0.77101	0.120641
S	74	204.9228	2.769228			
Total (Adjusted)	77	208.0413				
Total	78					
* Term significant at alpha = 0.05						

Table 58
RQ 5 - Gap 5 Research and Assessment: Years in Current Position ANOVA Table

Analysis of Variance Table						
Source		**Sum of**	**Mean**		**Prob**	**Power**
Term	**DF**	**Squares**	**Square**	**F-Ratio**	**Level**	**(Alpha=0.05)**
A: How_long	2	11.73889	5.869446	2.24	0.113267	0.443436
S	75	196.3024	2.617366			
Total (Adjusted)	77	208.0413				
Total	78					
* Term significant at alpha = 0.05						

Table 59
RQ5 - Gap 5 Research and Assessment: Position Considered ANOVA Table

Analysis of Variance Table						
Source		**Sum of**	**Mean**		**Prob**	**Power**
Term	**DF**	**Squares**	**Square**	**F-Ratio**	**Level**	**(Alpha=0.05)**
A: I_am	3	12.88307	4.294357	1.63	0.190067	0.410981
S	74	195.1582	2.637274			
Total (Adjusted)	77	208.0413				
Total	78					
* Term significant at alpha = 0.05						

APPENDIX J
RQ 5: Frequency Distribution Tables

Table 60
RQ 5: Frequency Distribution of Survey Statement 34: "… opportunity to express my perspective or make recommendations…"

Frequency Distribution of RQ6_34_D					
		Cumulative		**Cumulative**	**Graph of**
RQ6_34_D	**Count**	**Count**	**Percent**	**Percent**	**Percent**
1	5	5	7.25%	7.25%	||
2	3	8	4.35%	11.59%	|
3	10	18	14.49%	26.09%	|||||
4	26	44	37.68%	63.77%	||||||||||||
5	25	69	36.23%	100.00%	||||||||||||

Table 61
RQ 5: Frequency Distribution of Survey Statement 35: "… recommendations effect the decision making process…"

Frequency Distribution of RQ6_35_D					
		Cumulative		**Cumulative**	**Graph of**
RQ6_35_D	**Count**	**Count**	**Percent**	**Percent**	**Percent**
1	5	5	7.14%	7.14%	||
2	8	13	11.43%	18.57%	||||
3	14	27	20.00%	38.57%	||||||||
4	26	53	37.14%	75.71%	||||||||||||
5	17	70	24.29%	100.00%	||||||||

APPENDIX K
RQ 6 Pearsons Correlation Table

Table 62
RQ 6: Pearsons Correlation Table

Pearson Correlations Section (Row-Wise Deletion)						
	RQ6_34_D	RQ6_35_D	RQ6_36_D	RQ6_37_D	GAP_F1	GAP_F2
RQ6_34_D	1	0.770261	0.521606	0.13886	0.434336	0.303011
	0	0	0.000006	0.262428	0.00024	0.012686
	67	67	67	67	67	67
RQ6_35_D	0.770261	1	0.553392	0.215748	0.410415	0.326914
	0	0	0.000001	0.079524	0.000562	0.00693
	67	67	67	67	67	67
RQ6_36_D	0.521606	0.553392	1	0.457713	0.43682	0.342722
	0.000006	0.000001	0	0.000098	0.000219	0.004525
	67	67	67	67	67	67
RQ6_37_D	0.13886	0.215748	0.457713	1	0.174062	0.156249
	0.262428	0.079524	0.000098	0	0.158916	0.206713
	67	67	67	67	67	67
GAP_F1	0.434336	0.410415	0.43682	0.174062	1	0.805486
	0.00024	**0.000562**	**0.000219**	0.158916	0	0
	67	67	67	67	67	67
GAP_F2	0.303011	0.326914	0.342722	0.156249	0.805486	1
	0.012686	**0.00693**	**0.004525**	0.206713	0	0
	67	67	67	67	67	67
GAP_F3	0.246801	0.247217	0.196352	0.252426	0.846361	0.72393
	0.044072	**0.043706**	0.11127	**0.039321**	0	0
	67	67	67	67	67	67
GAP_F4	0.234816	0.206607	0.257246	0.10159	0.833908	0.651897
	0.045784	0.09345	**0.035595**	0.413345	0	0
	67	67	67	67	67	67
GAP_F5	0.306415	0.340249	0.440392	0.384423	0.876241	0.714372
	0.011673	**0.004844**	**0.000192**	**0.001319**	0	0
	67	67	67	67	67	67
Cronbachs Alpha = 0.884067 Standardized Cronbachs Alpha = 0.880950						

APPENDIX L
Conclusion Tables and Figures

Table 63
Responsibilities that AT professionals "Do"

	Mean	Mode	Median	Standard Deviation
Strategic Planning	3.30	3	3.43	1.10
Instructional Design	3	2.80	2.80	1.03
Ongoing Personal Professional Development	4.44	5	5	0.77
Academic Technology Management	2.60	1	2	1.39
Research and Assessment	3.24	-	3.33	1.03

Table 64
Responsibilities that AT professionals believe they "Should" fulfill

	Mean	Mode	Median	Standard Deviation
Strategic Planning	3.84	4	4	1.02
Instructional Design	3.47	2.80	3.40	0.92
Ongoing Personal Professional Development	4.60	5	5	0.63
Academic Technology Management	3.33	4	3.50	1.26
Research and Assessment	3.95	5	4	0.93

Table 65
Comparison of "Do" and "Should" responses

	Do	Should	Gap (ñDoò ï ñShouldò)	p-value
Strategic Planning	3.24 (n = 69)	3.84 (n = 69)	-0.59	0.00000*
Instructional Design	2.98 (n = 70)	3.47 (n = 70)	-0.50	0.00000*
Ongoing Personal Professional Development	4.44 (n = 68)	4.60 (n = 68)	-0.16	0.00091*
Academic Technology Management	2.53 (n = 68)	3.33 (n = 68)	-0.80	0.00000*
Research and Assessment	3.19 (n = 69)	3.95 (n = 69)	-0.76	0.00000*

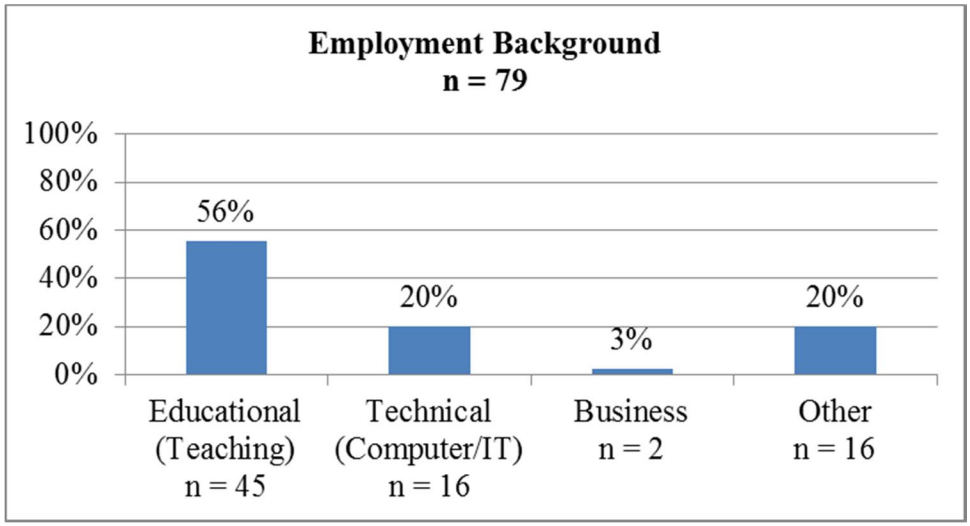

Figure 17. Employment background

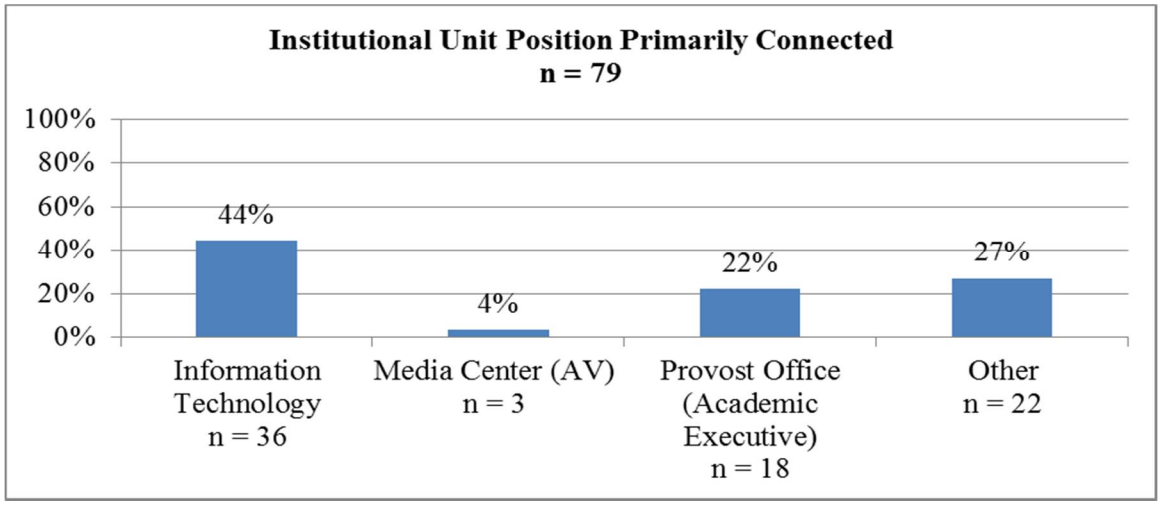

Figure 18. Institutional unit position primarily connected

Table 66
Strategic Planning gap based on Affiliated Institutional Unit

Characteristic	p-level*	Mean	Performance of Obligation and Responsibility
Unit connected to	0.04428*		Statistically Significant
Media Center (AV) (n = 3)		-1.54	Those connected to the Media Center reported the largest underperformance in Strategic Planning activities. Those connected to IT reported the least underperformance.
Information Technology (n = 33)		-0.01	
Other (n = 22)		-0.58	
Academic Executive (Provost Office) (n = 14)		-0.66	

* Significant at least the 0.05 level

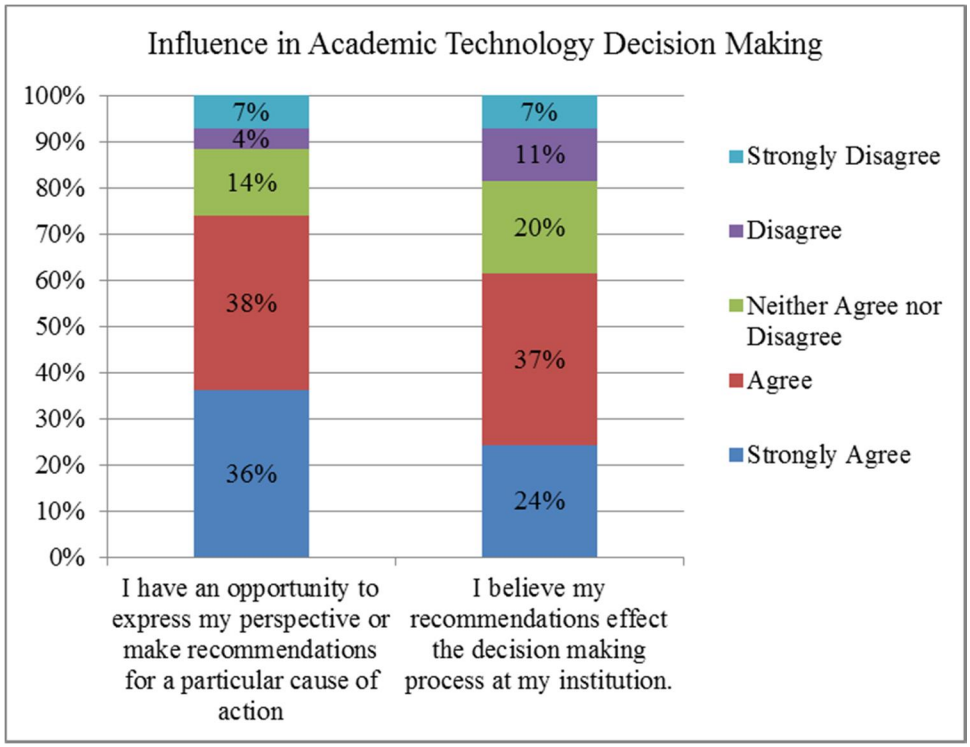

Figure 19. Influence in AT decision making