AN INFORMATION TECHNOLOGY PERSPECTIVE ON THE KNOWLEDGE, SKILLS, AND SUPPORT SERVICES THAT LEAD TO TECHNOLOGICAL FLUENCY AMONG COLLEGE STUDENT AFFAIRS PROFESSIONALS

by

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(Under the Direction of Diane L. Cooper)

ABSTRACT

The college student affairs profession has constantly adapted to the ever-changing technological environment within higher education. The profession has remained current or ahead many trends, but has experienced a gap between the technology-savvy student and the technology-phobic professional. The intent of this research was to learn about the current state of information technology use in college student affairs from information technology leaders' point of view.

Information technology leaders were defined as those individuals within, or working with, college student affairs. Measuring their attitude, belief and knowledge served as a foundation for developing a mixed methods description of the relationship of college student affairs professionals and information technology. A one-phase questionnaire soliciting quantitative and qualitative responses was used to survey 180 participants. The instrument included 23 quantitative and seven opened-ended qualitative questions. Statistical and qualitative analysis focused on five areas: support processes, technological fluency, technological skills, technology skill standards, and educational opportunities. In addition, four scales were developed

from the questionnaire items: the Frequency of Support, College Student Affairs Information Technology Fluency, Perceived Ability, and Perceived Performance Scales.

The findings showed that over 80% of the information technology leaders reported providing technical, educational, and training support to college student affairs professionals with specific computer applications, hardware use, and action items. College student affairs professionals exhibited fluency, and lack of it, through their attitude, behavior/action, and knowledge. Many of them were categorized as late majority adopters waiting for the critical mass to first adopt an innovation. The consideration of technology skill standards and the benefits to the profession received an affirmative response from the participants; however, dissension was voiced through qualitative results. Finally, information technology leaders and college student affairs professionals were identified as the two groups primarily responsible for supporting educational opportunities that promote the acquisition and development of technology skills and fluency.

The findings, outlined above, have future implications for both the professionals and information technology leaders. The implications address the concept of advanced learning for specific technology applications and concepts, skill standards, FITness, security, and the development of opportunities for partnerships between information technology and college student affairs.

INDEX WORDS: College Student Affairs, Information Technology, Information Technology Fluency, Skill Standards, Technology Education, Diffusion of Innovation, and Professional Development

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DEDICATION

I am blessed to have a wonderful mother, Gloria Ginger Cole, who has loved, encouraged, supported, and pushed me to always do my best and strive for excellence. I have learned how to be a confident, motivated, and sincere woman by watching her role model those values every day. She also taught me how to love the learning process. One of the happiest days of my life was watching her achieve her academic dream in 2003 when she received her doctoral hood from UCLA. My mother is phenomenal! My life has been magical and full because of her.

The other blessings in my life are the rest of my nuclear family, Glorya Denton (grandmother), Lessie Avent (grandmother), Anton Avent (father), and Howard Avent Jr. (uncle). Along with my mother, they have taught me about the Christian faith and have provided unconditional love and support. Each has made my life so special. I love them more than I can ever express.

This is also dedicated in loving memory of my grandfather, Howard E. Avent Sr., whom I wish was here to see this achievement in my life. I believe that his beautiful smile and joy are providing a wonderful glow in heaven.

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Many of my greatest experiences, along with personal and professional accomplishments, have occurred on college campuses throughout the world. In many of those cases, college student affairs professionals and faculty facilitated or encouraged my involvement. It was those meaningful interactions and the outcomes that lead me towards a career in this field. I have committed my professional life to advocating for college students and the student affairs professionals that work with them. I want to take this time to acknowledge those who were instrumental in my personal, academic, and professional life. As noted by Dr. Zenobia Hikes at the NASPA 2008 national conference, college student affairs professionals must embody the words of Benjamin E. Mays who said “every man and woman is born into the world to do something unique and distinctive and if he or she does not do it, it will not get done.” I strive to make my unique and distinctive contribution to the profession and to the students with whom I will interact in the future.

I am a proud graduate of Northwestern University (Go Cats!). It was there that I benefitted from services and became involved in programs sponsored by a division of student affairs managed by an amazing individual, Dr. Margaret Barr. It was also there that I had genuine, personal, and life-changing interactions with Dean Cathy Martin. She is the one that positively influenced my development the most. She inspired my pursuit for this profession. It has always been my desire to interact with students with the same attentive and caring nature that she showed me throughout my four years.

It was at the University of California, Los Angeles (Go Bruins!) that I was exposed the academic and practical components of student affairs. Although my time there was short, I gained the richest experience from the relationship that I established with Dean Joan Nelson. At that time, she served in the role as my supervisor; now, I am truly blessed to call her my mentor. She was my first professional student affairs role model and continues to be the one that I try to emulate. She taught me how to harness my professional excitement and turn it into administrative productivity.

The University of Connecticut (Go Huskies!), under the tutelage of Cathy Cocks, is where I learned to see that the work of student affairs was not dichotomous. Simply put, there is a lot of gray floating around. Cathy helped me to understand how to approach student affairs with a critical eye, looking at the whole picture. I also learned how to shut down proprietary clubs in the residence halls. The amount of admiration that I have for Cathy, gratitude for her willingness to see my potential and hire me without previous residence life experience, and appreciation for all that she taught me and continues to teach me can not be expressed in this paragraph alone. The best way to sum up the significant influence that she has had on my personal and professional life is “the bird is in the sky. Yum!”

It was also at the University of Connecticut where I met Dr. Jennifer Lease, a graduate from the University of Georgia. When I expressed my interest in pursuing a terminal degree, she served as a great sounding board. She also gently encouraged me to not overlook the University of Georgia and consider applying for the program. I am so grateful for her persistence in whispering the university name every time I saw her.

At the University of Georgia (Go Dawgs!), I worked with an incomparable group of faculty members, astounding supervisors, and classmates. I have a deep level of appreciation and

admiration for the College Student Affairs Administration faculty. My major professor, Dr. Diane Cooper, is one of the most phenomenal individuals that I know. During the time that I have worked with her, I have watched her receive honors for her commitment through her research and dedication to the profession. It has been an honor and a privilege to work with someone who has such a high level of respect from her colleagues, internationally. Through her guidance, I have acquired knowledge that is integral to my success. She has also helped me to grow as a researcher, writer, professional, and as an individual. I believe that what she has shared with me over these past years is only the tip of the iceberg. I am sad to see this time end so soon, but I anticipate that the connection will last for lifetime. In that time, I am excited about how much more I will be able to contribute and gain from the relationship. If I was able to put together a montage similar to the Gym Dogs, I would say, “There is only ONE Diane Cooper!”

Each faculty and committee member has uniquely contributed to my growth through their instruction and encouragement, while challenging me in preparation to transition to the next level. As I step forward to the next phase of my career, I will strive to represent the UGA CSAA faculty and program to the best of my abilities. I am thankful for Dr. Laura Dean serving on my dissertation committee as well as advising my teaching internship experiences. Dr. Merrily Dunn has been a great resource and sounding board. Dr. Richard Mullendore has helped me to strengthen my administrative thought processes. He also helped me to envision the type of scholar professional career that I may have through his belief in my abilities and potential. I am thankful to Dr. Alan Stewart for volunteering his time to serve on my dissertation committee and for introducing a new perspective and resources to my research area.

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Smith. They provided new work experiences, allowed me to explore my professional interests, and gave me challenging tasks to hone my existing skills.

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My attempt at a balanced existence was achieved through the connections with lifelong friends and new ones that I met in Athens. My sister circle was composed of a dynamic group of women who served as a source of unconditional support. The stumbles on the path to this achievement would have been more challenging without them. This group includes Marian Higgins, Khrystal Smith, Kayla Hamilton, Dr. Wanda Gibson, Candace Maddox, and Cara Simmons.

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This has been an awesome experience. The University of Georgia served as the catalyst for me to achieve a dream. Although it is bittersweet to leave, it's time for me to begin on the quest to make my unique and distinctive contribution. All the best!

~ Gail A. Cole-Avent

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CHAPTER 1

INTRODUCTION

College Student Affairs and Information Technology

The college student affairs profession has constantly adapted to the ever-changing environment within higher education. The profession has remained current or ahead of the trends in crisis management, assessment, student learning, collaboration with academic affairs, and professional standards. Traditionally known within higher education for their expertise in those areas, along with student development and innovative programming, college student affairs professionals cannot claim that same expertise status in the area of information technology. Professionals currently work in an unfamiliar territory, even though "there is hardly a sector of student affairs that has not had to adjust to or incorporate advanced technology" (Love & Estanek, 2004, 153).

Information technology has positively contributed to college student affairs work through environments that support community development via social and professional networking (Moneta, 2005), web-based student services (Shea, 2005), and assessment and evaluation (Hanson, 1997), resulting in the potential increased efficiency of administrative processes and services. Conversely, the profession has also witnessed the negative aspects of information technology including legal, ethical and institutional policy issues that address privacy, intellectual property and copyright infringement, and Internet addiction (Kruger, 2005b; Petersen & Hodges, 1997). Although there are documented positive and negative characteristics,

recommendations throughout the literature have continued to suggest that information technology should be thoughtfully considered and incorporated into practice, programs, and services (Baier & Strong, 1994a; Elling & Brown, 2001; Engstrom & Kruger, 1997; Kruger 2005a; Love & Estanek, 2004; Strange & Banning, 2001). The difficulty in addressing those recommendations is the challenge of information technology fluency among professionals.

College student affairs professionals are not prepared to accommodate the technology-savvy student (Moneta, 2005). The future of the profession depends on college student affairs professionals' knowledge and understanding of the influences of information technology (Kleinglass, 2005). The issue remains that professionals have not demonstrated technology insight or understanding of how important their role is in incorporating information technology to influence services, learning, and developmental outcomes. It is challenging to address this current trend with the scarcity of available college student affairs literature educating the professional on the mechanics and application of information technology. That which exists provides them with standard information that follows a template: introduce the overall concept of information technology, describe today's college students and the popular applications they use, and provide recommendations to incorporate information technology.

In order to equip college student affairs professionals with the necessary skills to successfully integrate information technology into practice, it is important to further investigate their level of technological fluency and the most effective ways to educate them. There has been a common thread throughout the literature over the past fifteen years, calling to attention the lack of information technology education that college student affairs professionals have experienced. Baier (1994) believed that technological illiteracy was one of the largest obstacles that

professionals have had to overcome in order to successfully embrace information technology and incorporate it into practice. At that time, the early 1990s, the modern day higher education information technology explosion was beginning and the majority of professionals had no prior experience or knowledge. The gap between the technology savvy student and technology phobic professional was widening. The need for developing professional competencies had reached a critical point (Moneta, 1997). Elling and Brown (2001) stated that an information technology skill set should be higher in order to adequately make decisions, develop solutions, and critically analyze the types of available resources. Kennedy (2003) argued that professionals must obtain an understanding of the computer skills deemed important to the profession. Kleinglass (2005) offered a suggestion that professionals need to continue to improve their skills, and offered a proficiency model based on information technology tools, software, and activities.

Individually, information technology and college student affairs are complex topics. They continually evolve while research supports the necessity of both in higher education. How to successfully combine the two realities of information technology and college student affairs is elusive. There is no definitive answer. Researchers have approached it from a broad perspective focusing on what technologies college students use and how the profession, as a whole or by functional areas, has responded. Beyond the standard recommendations that declare that college student affairs professionals need to be proficient, minimal research has been published on what it takes to combine the two successfully. More importantly, there has been a lack of focus on college student affairs professionals' use and understanding of technology.

Researchers have acknowledged that college student affairs professionals are in an awkward situation. College student affairs professionals approach information technology the

same way they approach their work (W. Barratt, personal communication, August 30, 2007). They want to preserve the value of interpersonal interactions and have not overwhelmingly adopted technological innovation. In order to achieve the seamless integration of information technology into professional life, training is needed (Elling & Brown, 2001). Kleinglass (2005) believed that the profession has reached the crossroads. For college student affairs professionals to address the future of integrating information technology into the profession, they must be able to identify the information technology trends, be fluent with technological tools, comprehend the purpose and function of the given technology, understand the impact of technology, identify the implications of technology-driven change, and prepare for the challenges of incorporating technology into a division.

Information Technology in Higher Education

In addition to college student affairs, the information technology movement has influenced pedagogy, services, management, student access, and the overall infrastructure of the higher education landscape. "Developed in the laboratories of university scientists and engineers" (Duderstadt, Atkins, & Van Houweling, 2002, p. 38), information technology has transformed the general fundamental core principles of the academy: teaching, scholarship and outreach (Duderstadt et al., 2002). For example, the teaching advancements achieved as a result of the information technology movement have provided innovative ways for higher education institutions to prepare today's college students to influence the American and global workforce (Elling & Brown, 2001).

Information technology has not only influenced the infrastructure of higher education, it has influenced the primary consumers of higher education: students. The Net Generation, born

between 1978 and 1997, is the largest generation since the baby boomers and has enrolled in higher education in record numbers (Tapscott, 1998). Described as citizens of the digital age, they have co-existed with computers since childhood, stayed electronically active around-the-clock, learned to communicate and network through interactive technology, and become accustomed to accessing services instantaneously (Duderstadt et. al, 2002; Elling & Brown, 2001; Moneta, 2005; Tapscott, 1998). The Net Generation has used information technology to manage the majority of their academic and personal lives prior to attending college and expects to continue once enrolled. Aviles, Phillips, Rosenblatt, & Vargas (2005) believed that in order for faculty and college student affairs professionals to meet the growing demand for information technology in higher education, it is imperative to understand these students and their use of information technology.

While the technology influence on higher education has provided innovative ways to approach educating and supporting the college student, it has also served as one of the primary challenges. With the constant evolution of information technology and high expectations from students for access to cutting edge information technology, it is difficult to continually keep current and integrate it into practice. Electronic mail, web-based course management and discussion boards, and Microsoft PowerPoint presentations have been sufficient for a number of years. However, faculty and college student affairs professionals have begun to adopt current technologies, such as virtual environments, podcasting, and web-based designs for registration to educationally engage students and provide efficient services that mirror existing ways students use information technology.

The efforts to be technologically current may result from differing factors: student requests, faculty or college student affairs professionals' curiosity, information technology leaders' promotion, or popular media. Constantly being surrounded by computers, electronic communication, digital information, and software has made higher education realize that understanding information technology adds value to what may be achieved professionally and personally (Lin, 2002). Compared with college student affairs, faculty and information technology leaders have the most literature, national resources, and campus-based resources available to assist them in addressing current trends in higher education, curriculum development, and skills standards.

Purpose Statement

Duderstadt et al. (2002) inquired about how higher education leaders can prepare professionals through training, support, and use of equipment to keep current with the rapid pace of information technology. Their inquiry reflected the question being asked within college student affairs. In order to satisfy the recommendations to incorporate information technology into practice, what can college student affairs leaders do to prepare professionals to work successfully with information technology? Those leaders who have been surveyed in the past are chief senior college student affairs administrators (Elling, 1997) and faculty (Bowman & Cuyjet, 1999). Even professionals have been asked about their perceptions of the types of preparation they need (Kennedy, 2003). Each study provided information about the participants' experiences and knowledge, which has influenced the outlook of college student affairs and information technology. However, one sector that has not had a dominant collective voice represented in the literature is the information technology leader in college student affairs.

The intent of this research was to learn about the current state of information technology use in college student affairs from the information technology leaders' point of view. The information technology leaders within, or working with, college student affairs possess the most critical insight to understanding the current status of college student affairs and what is needed to enhance the professional's ability. In an effort to contribute to the transition of college student affairs into an information technology fluent profession, focusing on this specialized leadership may result in findings that help to *operationalize* the development of functional processes that address the growing need to establish expertise and the ability to integrate information technology into practice.

To address the purpose of this study, the following research questions were investigated.

1. What do information technology leaders report as the support processes they provide to college student affairs professionals?
2. How do information technology leaders rate the current technological fluency of college student affairs professionals at their institution?
3. How do information technology leaders rate the current technological skills of college student affairs professionals at their institution?
4. How do information technology leaders rate the importance of the development of technology skill standards applicable to college student affairs work?
5. What do information technology leaders believe should be incorporated into educational opportunities preparing college student affairs professionals to work with technology?

Rationale for the Research

Baier (1994) argued that the profession needed to develop technology literacy and competency training efforts that would address the needs of staff. He further stated that unless professionals were knowledgeable and able to properly use the technological advances, they are missing out on the benefits of this innovation. This statement, applicable almost 15 years later, served as the primary foundation of this research. There have been numerous opportunities for college student affairs to embrace information technology and apply it to work in order to yield innovative and efficient services, but the educational piece must still be addressed. As stated by Love and Estanek (2004), the "techies" are not solely responsible for information technology within college student affairs.

"An important competency needed for effective student affairs practice now and in the future is a technology mindset – the willingness to perceive, critically engage with, adapt, apply and assess technology in student affairs work" (Love & Estanek, 2004, 153). The topic of information technology and college student affairs is a current trend that reflects a resource that is often used in the work setting, yet the amount of time spent researching professionals' use is minimal. There may be many reasons why it is not at the top of research and publishing agendas; however, practical recommendations and suggestions are needed immediately. It is a crucial time for college student affairs to make information technology an expertise area and move the professional from technologically ignorant to fluent.

"The profession must, therefore, invest in the most complex piece of technology, the education of the student affairs staff members" (Baier, 1994, p. 25). The goal of this research was to identify strategies which may be used to help transition the profession from the standard

recommendation to actual application. Information technology leaders within, or working with, college student affairs were the targeted population based on what they have contributed to the current state of college student affairs and information technology. Love and Estanek (2004) suggested that college student affairs move past solely relying on information technology leaders to be responsible for the technology movement in the profession; however, at this point, the information technology leaders are the best resource to rely on as college student affairs professionals try to fully understand the potential of this trend.

The role of the information technology leader has transitioned from specialist to generalist, with the responsibilities of serving in the essential role of supporting the integration of information technology into administrative processes. These leaders have promoted collective ownership of information technology among professionals by providing education, training, and encouragement (Hawkins & Marcum, 2002). By targeting information technology leaders, the goal was to measure their behaviors regarding how they support college student affairs professionals, their knowledge about information technology fluency and abilities of college student affairs professionals, and their attitudes about future educational opportunities. They are in a unique position in that they may know the upcoming information technology trends and the proficiencies needed to implement them successfully within the higher education setting.

Research Design

To explore the current state of information technology use in college student affairs from the information technology leaders' point of view, a mixed methodology design was implemented. The purpose for using this type of design was for expansion intent, which focused on increasing the scope and breadth of understanding of the study (Greene, Caracelli, & Graham,

1989). This was achieved through the multiple methods of inquiry of different components of the phenomenon (Greene et al.). A triangulation design-validating quantitative data model was a one-phase design in which complementary quantitative and qualitative data were collected within one phase (Creswell & Plano Clark, 2007). This model of inquiry was represented by a questionnaire that collected quantitative data, along with a limited number of open-ended qualitative questions. This concurrent procedure allowed for both data types to be gathered, integrated and used to interpret the findings (Creswell, 2003).

Delimitations

There were potential limitations to this study. The success of this research depended on a narrow population. The primary target population was the information technology leader working within college student affairs. Nationally, this may be a rare position, even though I have worked at two institutions where the division of student affairs had an established information technology support department. Therefore, information technology leaders representing a centralized institutional department responsible for supporting college student affairs departments were solicited to increase the sample size. As a result, this led to a second limitation. These research questions were developed with the assumption that information technology leaders had enough work experience with college student affairs professionals and their functional responsibilities in order to provide answers that would contribute to the purpose of the study. Lastly, administering a locally designed instrument led to questions of the quality, credibility, validity of the measurement tool (Schuh & Upcraft, 2001) and its influence on the research findings.

Definitions

Information technology and college student affairs are research areas with expressions that often have multiple meanings. Definitions are provided to create a common understanding of the key terms that will be used throughout this study.

Information technology. Information technology is a broad term with varying components to define it. It is known as computational devices used for general purposes, application software, and operating environments (National Research Council [NRC], 1999). It also represents a scientific understanding of the hardware aspect of a frame protecting electronic components consisting of semiconductors, transistors, electrical connections; as well as software consisting of "coded commands, instructions, manuals, and other aspects of this tool that allow us to use it for certain tasks" (Rogers, 2003, 13). For the purpose of this research, information technology was defined as "the development, installation, and implementation of computer systems and applications" (Houghton Mifflin, 2005).

Information technology fluency. The National Research Council, Committee on Information Technology Literacy (1999) defined the concept of fluency as knowing and understanding information technology in a way that leads to the effective use of it for personal and professional productivity. The committee further described achieving fluency by continually engaging in lifelong learning about information technology, applying existing knowledge to adapt to changes, and acquiring knowledge in order to effectively implement information technology. Within the higher education and college student affairs literature, the terms net- or

technology-savvy and technologically proficient were used. For this research, technology fluency was adopted in order to be consistent with what was being promoted currently within the information technology profession.

Information technology leader. According to Freeman and Aspray (1999), a universal title describing professionals responsible for information technology was extremely difficult to define due to the numerous occupations that fit within the work category. The Committee on Workforce Needs in Information Technology (2000) identified two categories for this population. The first category included those that designed and developed artifacts or system-wide applications. The second category included those that configured, supported, and implemented products created by others. For the purpose of this research, the chosen term 'information technology leader' fit into either category. Therefore, the definition for an information technology leader working in college student affairs was an individual responsible for managing technology services, information technology, educational technology or technology support for a college student affairs division or department. An information technology leader working with student affairs was an individual who worked within a centralized information technology department that supports the university.

Summary

Komives and Petersen (1997) argued that college student affairs had the opportunity to take on a role of "guides and pathfinders" for those who were fearful or overwhelmed by technology (p. 83). This would thrust professionals into that familiar position of awareness and understanding of a current trend and the ability to successfully adapt to technology. This adaptation would result in innovative programs and services that promote the institutional

mission and meet the needs of the student and professional populations. The challenge remains that this "futurist" (Komives & Petersen, 1997) look at the profession's role is not realistically supported by the current state of affairs. The literature expressed that college student affairs professionals are behind in their knowledge, yet information technology continues to rapidly transform the activities of the college environment beyond conventional space and time (Duderstadt et al., 2002). Information technology leaders within, or working with, college student affairs were the most logical and understudied resource available to understand how to transition the profession into one that is technologically fluent. They provided one of the most educated perspectives which, in turn, may help the profession understand its current state and its future potential.

CHAPTER 2

REVIEW OF LITERATURE

Overview

The intent of this research was to learn about the current state of information technology use in college student affairs from the information technology leaders' point of view. To accomplish this task, literature from various research areas was collected and examined. It was necessary to widen the literature search parameters beyond college student affairs in order address the topic of information technology in the most comprehensive way. Information technology continuously grows and has been addressed through individual functional areas and collaborative efforts in higher education.

The review addressed the use of information technology within today's society, specifically looking at the factors that influenced an individual's (or an organization's) adoption of information technology, along with the largest consumer subpopulation, college students. Next, the review outlined information technology within higher education by examining its role, the management of resources, and desired end-user competencies. The review then highlighted information technology leadership within in higher education, the roles and responsibilities, and professional skill standards.

The last section focused on the body of literature that described how college student affairs have approached information technology use by looking at the professional beliefs and attitudes, methods of adoption, professional fluency, and suggestions for professional and

proficiency development. A final synthesis of the literature and its relationship to the purpose of this study was provided to support the development of an understanding of how these various areas influenced the need to conduct this research.

Defining Information Technology and Fluency

The demand for access to higher education, around the clock and from any location, has influenced how information technology has been used to cater to teaching, learning, and service (Katz, 1999). Information technology has infiltrated every aspect of higher education and has grown faster than most in the academia or society ever anticipated. At one time, information technology specialists primarily managed all of the information technology. Today, everyone has taken responsibility for its impact, understanding that no one individual or department directly controls it (McClure, 2003). To compete internationally, and remain competitive, United States companies and higher education institutions closed the gap between the level of technological preparation of employees and the skills, knowledge, and qualifications necessary for success in the workplace (Northwest Center for Emerging Technologies [NWCET], 1999).

"Information technology is a medium that permits the expression of a vast array of information, ideas, concepts, and messages…" (National Research Council [NRC], 1999, 15). According to McClure (2003), information technology consisted of five basic elements: 1) the delivered services to an institution, such as electronic mail, conferencing and payroll; 2) the hardware and software technologies that supported the delivered services; 3) the professionals that managed the technology and services and supported others' use of them; 4) the financial resources that supported the services, technology, and professionals; and, 5) the institutional culture that dictated the first four elements. Understanding and applying information technology

was often referred to interchangeably with the terms “literacy” and “fluency”. According to researchers, there was a difference and both required evolving knowledge and skills among individuals (Agee & Zenelis, 2002).

Agee and Zenelis (2002) believed information technology literacy focused on dealing with information from an intellectual framework. Literacy is acquired, but not viewed as the end goal, because it referred to the current skill ability of an individual and usually was updated at the same pace as the rapid change of information technology (NRC, 1999). Past essential skills that implied literacy included being able to set up, connect to, or use: a personal computer, basic operating system, word processor application, artwork and graphics applications, networks, the Internet, the computer as a communication tool, spreadsheet applications, database system, and applications from instructional materials (NRC).

Conversely, information fluency was more extensive. The National Research Council, Committee on Information Technology Literacy (1999) developed a report that addressed and promoted fluency within all disciplines. They used the terminology *FITness*, which represented the concept of “fluency with information technology” and established a framework to promote this concept. The Committee acknowledged that as information technology changed, existing literacy became antiquated; therefore, they developed a solution to help individuals adapt to those changes. Fluency was defined as the lifelong learning process that involved applying existing knowledge in an effort to adapt to the change. It also focused on continually acquiring knowledge for the effective implementation of information technology in the present and future. FITness was described as the ability to appropriately evaluate, distinguish, learn, and use information technology.

Successful fluency required knowledge of contemporary skills, fundamental concepts, and intellectual capabilities, which interact with each other to reinforce a deeper comprehension of information technology (NRC, 1999). Contemporary skills represented the ability to use a computer and computer applications to accomplish a task. Fundamental concepts were referred to as the "book learning" portion of fluency by addressing the opportunities and limitations of information technology. Intellectual capabilities were considered the "life skills". It is applying information technology to address complex scenarios, understanding the types of consequences that may result, and exhibiting a higher-level of information technology comprehension (NRC).

Adoption of Information Technology in Today's Society

The American society's understanding of information technology encompasses a broad spectrum of ideas from multiple arenas. Corporations, governmental agencies, higher education, non-profit organizations, entertainment media conglomerates, and the individual person adopted information technology in drastically different ways, depending on the consumer need. Each relied on information technology to support different purposes: business, education, social needs, or entertainment. This section introduces a conceptual framework that describes the decision-making process and how it leads toward the adoption or rejection of innovation (Rogers, 2003); and concludes with an overview of the largest consumers of information technology, the Net Generation (Tapscott, 1998).

Roger's Diffusion of Innovation Framework

Initially published in 1962, *Diffusion of Innovation* is in its fifth edition (Rogers, 2003). In the forty-plus year tenure of this publication, Rogers has continually updated and adapted his concept of diffusion of innovation to past and current scenarios, such as typewriter keyboard

design and cellular phones. The text provided a comprehensive view that included, but was not limited to, the history of diffusion research, contributions and critiques of the research, and diffusion throughout the generations. The highlighted components are the elements of diffusion, adopter categories, the individual and organizational innovation-decision processes, and consequences of innovation (Rogers, 2003).

Rogers' (2003) concept is not easily understood unless the key elements of diffusion are defined: diffusion, innovation, innovativeness, champion and anti-innovation champion.

- Diffusion - the "process in which an innovation is communicated through certain channels over time among the members of a social system" (p. 5), which included distributing new ideas through planned or spontaneous efforts.
- Innovation - the perception that an individual or organization considered an idea, practice, or object to be new. Innovativeness was the placement within a timeline when an individual or organization adopted new ideas compared to others in a larger system.
- Champion - an individual described as charismatic and important to promoting innovation. This charisma influenced an organization's response to an innovation. If the champion supported the innovation there was less indifference or resistance from the members of the organization.
- Anti-innovation champion - an individual that hinders an organizations' adoption of innovation.

Collectively these terms comprised the concept of diffusion of innovation, which influenced the innovation-decision process.

Adopter Categories

Rogers (2003) also developed categories portraying the various types of adopters of innovativeness: innovators, early adopters, early majority, late majority, and laggards. The number of individuals reflected in each category typically followed the normal distribution pattern or the s-shaped curve. The distribution was based on the rate of adoption of individuals or units within an organization. Each adopter type was comprised of characteristics that represented the speed that an individual or unit adopted a new idea compared to others in the organization. The distribution is expected to be normal because it follows the flow of information exchange, which traditionally begins with one person sharing with others, resulting in the multiplication of individuals gaining access to the information. The distribution ends with a few who have not been engaged in those conversations.

Innovators, also referred to as venturesome, were those interested in a new idea, practice, or object. They were comfortable in handling the possibility that an innovation may be successful or unsuccessful. They had the capacity to work with complex technical concepts and understand how to apply them. The innovator assumed the role of gatekeeper by importing an innovation from another arena and launching it within the organization (Rogers, 2003).

Early adopters, often recipients of the greatest amount of respect in an organization, were those to whom most members in organization look for advice about an innovation. Their peers saw them as successfully integrating new ideas. They were closer to the majority that adopts innovation, but ahead of the curve enough to serve as a role model to others that were contemplating what to do with a new innovation. The early adopters' decision triggered the critical mass to respond (Rogers, 2003).

The early majority, one-third of an organization, was one step ahead of the average members of an organization in their willingness to adopt an innovation, but rarely lead the charge. They were known to be deliberate and to take the necessary time to fully understand the influence of the innovation before completely adopting; however, they were uniquely located between the very early and relatively late adopters. The early majority category served as the critical link to the diffusion process. The early majority used to deliberate for some time before completely adopting an innovation (Rogers, 2003).

The late majority also composed one-third of an organization. Known as cautious or skeptical, their adoption was normally based on peer pressure or economic necessity. They would wait until the critical mass had favorable critiques and uncertainty was removed before adopting a new idea, practice, or object (Rogers, 2003).

The final group of individuals to adopt new ideas is known as laggards. They were slow to change because their continual point of reference was what occurred, or what decisions were made in the past. Suspicion of, and resistance toward, an innovation and those who promoted it was common. The innovation had to be proven fail-safe before the laggards considered adoption (Rogers, 2003).

Innovation-Decision Process

> The innovation-decision process is the process through which an individual (or other decision-making unit) passes from gaining initial knowledge of an innovation, to forming an attitude toward the innovation, to making a decision to adopt or reject, to implementation of the new idea, and to confirmation of this decision (Rogers, 2003, 168).

The process involved the evaluation of a new idea over time and the decision of whether or not to incorporate the innovation into existing practice. For the decision-maker, the process consisted of five stages: knowledge, persuasion, decision, implementation, and confirmation. In the knowledge stage, an individual gained exposure and understanding of how an innovation functioned. Persuasion was the favorable or unfavorable attitude made toward the innovation. After engaging in activities around the innovation, a decision to adopt or reject the innovation was made. Implementation was described as putting the innovation into use. Confirmation served as the assessment process of the innovation-decision to either support the continuation of it or reverse the decision (Rogers).

The innovation-decision process for an organization included additional influential factors. There were four types of innovation-decisions: optional, collective, authority, and contingent. Optional innovation-decision was described as the choice to adopt or reject an innovation, based on an individual decision, independent of others in the organization. Collective innovation-decision was the decision to adopt or reject an innovation, based on the collective decision of organizational members. Authority innovation-decision was the choice to adopt or reject an innovation, based on the decision of senior leadership or experts. Contingent innovation-decision was the choice to adopt or reject after another type of innovation-decision was made (Rogers, 2003).

The five stages of the innovation process for organizations were separated into two phases: initial and implementation. The initiation phase involved the process of collecting information about an innovation, conceptualizing it, and planning for its potential adoption. The two stages included in this phase were: the agenda-setting stage, which was the identification of

a problem that may be addressed by an innovation; and, the matching stage, which was matching the identified problem with a specific innovation. The last three stages included in the initial phase were: redefining/restructuring, the modification of the innovation and alteration of the organization so the both would match; clarifying, the period of time when the relationship between the two were clearly defined; and, routinizing, the final portion of the process when the innovation was completely integrated into the organization and no longer seen as different (Rogers, 2003).

Rogers (2003) noted that considering the adoption of innovation had potential consequences. That is, the possibility of changes that may occur within an individual or organization as an outcome of the adoption or rejection of an innovation. There were many types of consequences. Desired and undesired consequences represented the functional and dysfunctional effects of an innovation. Anticipated and unanticipated consequences were the intentional or unexpected changes that resulted from the innovation.

There were three types of equilibrium. Stable equilibrium known as the innovation outcome that yielded no change. Dynamic equilibrium described that the rate of change was consistent with the organizations ability to manage it. Disequilibrium showed that the organization was unable to manage the innovation due to the rate of change (Rogers, 2003).

Innovation of Diffusion (Rogers, 2003) was an established conceptual framework that applied to individuals and organizations throughout society, including higher education and its leadership. The adopter categories represented individuals that could be found within the various populations and organizational levels within an institution.

One of the subpopulations that has been the focal point of research, but will not be a major component of this study, is today's college student. It is beneficial to include them in the literature review because they are one of the primary catalysts driving the information technology change in higher education (Zeff, 2007).

Today's College Student

Innovation, especially technological innovation, is prevalent in American society. Technology has become the way of life for many who have adopted or accessed tools, such as the Internet, cellular phones, digital media and music players, interactive learning tools, or Internet wireless connections within coffee shops. Although information technology is used among young and old, the group that has been highlighted the most in popular media and the literature are the traditionally aged college student.

As noted by Windham (2005), college students are members of the largest generation and are also the most technologically proficient. They remain ahead of the current trends with new technologies because they learned by exploration, not by waiting to learn about it in a formal setting. These students, referred to as the Net Generation (Tapscott, 1998), used innovative technology in ways that became a societal phenomenon. Information technology influenced the culture and development of this generation because they have grown up with computers, the Internet, instant messaging, text messaging, and downloadable music (Roberts, 2005; Zeff, 2007). Students continue to use information technology because it can be manipulated to fit their needs (Roberts, 2005). For example, they found ways to easily navigate through life's daily chores due to features such as Internet-based banking and shopping (Windham, 2005).

Technological innovation has influenced other aspects of life for the Net Generation. The development of community was one of the more popular aspects for research. As Oblinger and Oblinger (2005) observed, this generation of college students used information technology as a vehicle to meet people, experience new cultures, and express their feelings and views. Instead of going to the playground or watching television, they accessed the Internet to chat with friends who resided next door or lived in a different country (Tapscott, 1998). Virtual communities and social networking sites, such as Second Life (Linden Labs, 2003), facebook.com (Facebook, 2006), and YouTube (YouTube, n.d.) supported these interactions. Being engaged in conversations within virtual environment was viewed as just as important as face-to-face interactions (Oblinger & Oblinger, 2005). Aviles, Phillips, Rosenblatt, and Vargas (2005) concluded that today's college students were accustomed to using the information technology first to make social connections, and then they followed-up with face-to-face interactions to solidify the relationships. Today's college students arrived on campuses with high expectations for the availability of information technology and the ability to use it to enhance their learning experiences (Kesner, 1998).

Information Technology in Higher Education

As technology evolved, colleges and universities continually addressed the concerns of designing, developing, financing, and integrating an information technology infrastructure which would affect the fundamental purpose of teaching, research and outreach (Duderstadt, Atkins, &Van Houweling, 2002, 42). Whether it was a conscious effort or not, information technology became an essential component of how faculty and administrators operated (Foster & Hollowell, 1999). Its influence on higher education has altered teaching, scholarship, and services (Katz &

Rudy, 1999). It is important that information technology be viewed as an opportunity to enhance and enrich the most essential activities that support the mission of an institution (Duderstadt et al., 2002).

This section outlines information technology leadership within higher education, the roles and responsibilities, and professional skill standards.

The Role of Information Technology in Higher Education

Communication, work, learning, and the delivery of programs were transformed by innovative uses of information technology (Kesner, 1998). Information technology has been prevalent in all facets of an institution and has changed the manner in which the campus operates within the context of the research, teaching, and service mission (McClure, 2003). It has contributed to the new innovative approaches to research, administrative activities, collaborative efforts, community building, financial policy development, and a generation of new academic disciplines (Dodds, 2007; McClure, 2003).

The Management of Information Technology within Higher Education

Duderstadt et al. (2002) believed that university leaders had to make decisions regarding the influence of information technology on their institutions. The authors posed numerous questions in an effort to help those leaders make the important decisions and understand how information technology would transform the current existence of the institutions. As an example, some of following questions were asked:

- How will the residential campus experience be affected?
- How should the university approach its operations and management to best take advantage of this technology?

- How can one provide students, faculty, and staff with the necessary training, support, and equipment to keep pace with the rapid evolution of information technology?
- What kind of information technology infrastructure (hardware, software, staffing) will the research university need, and how will it finance the acquisition and maintenance of this infrastructure?
- What policies does the university need to reconsider in light of evolving information technology (e.g., intellectual property, copyright, instructional content ownership, and faculty contracts)? (p. 17).

College and university leaders should not be surprised that the advances in information technology has affected their structure, especially as knowledge-driving organizations (Duderstadt, 1999).

Effectively managing information technology is the key to successful adoption and integration into the existing formation of higher education. Kesner (1998) stated that everyone within an institution's community had a responsibility for contributing to the management and realization of an information technology strategy. For example, faculty should have considered how to incorporate it into their educational strategies and administrators must have learned how to use it for the effective management of their services. The management of information technology within higher education relied on designing a process and structure that combines the five basic elements of information technology, referenced earlier: services, technologies, professionals, finances, and institutional culture. The aim was to manage the elements through planning, organizing, funding, assessing, governing, and nurturing (McClure, 2003).

Desired End-User Competencies

McClure (2003) mentioned that one of the basic elements of information technology management was supporting institutional employees in their use. The literature suggested that institutions develop desired competencies among employees, specifically for faculty and administrators. Kesner (1998) believed that the development of core competencies would play a major role in readying a campus for integrating information technology. Those core competencies would be placed in each employee's position description, along with a statement regarding an employee's personal responsibility to develop and renew the competencies. In addition, the development of specific competencies tied to individual roles would help the employees to become fluent. In the long run, competencies would not only satisfy the institutional need, but it would also increase the value of the employees and the possibility for career advancement (NWCET, 1999).

If faculty developed information technology competencies and adopted those technologies for educational purposes, a change would occur in higher education (King, 2002). In order for that to happen, faculty must have access to resources and tools that would help them to utilize information technology in their research and curricula development, along with demonstrating the importance of it to students (Kesner, 1998). However, faculty members have often felt uncomfortable and overwhelmed when confronting a new information technology, especially when possessing a high level of competency within a discipline (Reimer, 2005).

Similar to faculty members, administrators also tended to be uncomfortable and overwhelmed with information technology. Despite the fact, administrators are known to take advantage of competency training options, more than faculty, due to the higher expectations for

familiarity with standard office technologies. The necessary competencies identified should be those that would equip them with the ability to operate an information technology system on their own, if needed (Kesner, 1998).

Information Technology Leadership in Higher Education

Colleges and universities have been challenged with ensuring the availability and efficiency of information technology. This has been during a time period where more information technology leaders, especially with specific technical skills, were needed in order to advance the institution (Hawkins & Marcum, 2002). Add to that notion, the quickly changing nature of technology and the increasing faculty, administrator, and student demand for world-class access to technology within higher education, and it is understandable how campus information technology leaders have been constantly under extreme pressure (Aspray & Freeman, 2002; Smallen & McCredie, 2003). It is important to recruit and employ professionals who exhibit the knowledge, skill and leadership ability to address the challenges (Neal & McClure, 2003) and successfully guide institutions in the adoption and integration of information technology into the existing structure.

The next section highlights information technology leadership in higher education, professional roles and responsibilities, and professional skill standards.

Information Technology Leadership

Information technology leadership is critical in the central administration of a college or university (Hawkins & Marcum, 2002). Throughout the literature, those who served in leadership roles were defined by different names or analogies. For example, McClure (2003) referred to them as "gardeners" in that they plant seeds of ideas that yield the benefits of the

information technology revolution's influence on institutional change. Penrod (2003) described the majority of information technology leaders as "independent professionals," not affiliated with a central technology administrative office, responsible for supporting specific departments or buildings.

Freeman and Aspray (1999) developed a four-category approach to defining information technology leaders, separated into the two categorizations. The first category distinguished between "information technology workers" and "information technology-enabled workers." The difference between the two was based on the nature of the professional responsibilities. Information technology workers primarily spent more than 50% of their work time on technology-specific matters within their organization. Information technology-enabled workers primarily accessed technology, and used it less than 50% of designated work time. The second category differentiated the type of information technology positions available: *conceptualizers*, *developers*, *modifiers/extenders*, and *supporters/tenders*. Conceptualizers drafted an idea of the basic nature of a technological tool. Developers specified, designed, constructed, and tested it. Modifiers/extenders adjusted or added on to it. Lastly, supporters/tenders delivered, installed, operated, maintained, and repaired it.

Roles and Responsibilities

Information technology leaders have numerous roles and responsibilities within their respective institutions, including the management of services, security, and finances. The concept of the information technology organization was once known as a collection of independent professionals. The mechanics of the organization today developed into a centralized unit responsible for the management of the technological infrastructure, while being supportive

of the end-user community through training opportunities, help desks, and communication (McClure, 2003). An important component of information technology is security. These leaders are responsible for developing effective policies, providing financial and administrative support, educating the community about the importance of computer and network security, and maintaining the security of the information technology infrastructure (Johnson, Mitrano, & Vernon, 2003). Another component of information technology identified was its expense. Under the pressure to reduce costs while increasing access, leaders have developed financial strategies through options such as external grants, technology fees, government support, and internal funds (Bates, 2000).

Information Technology Skill Standards

With differing position titles, responsibilities, and organizational structures, the leadership has a common understanding through information technology skill standards. These standards "define the professional job-related knowledge, skills, and abilities required to succeed in the digital-age workplace. They can be used as a foundational tool for developing educational curriculum, profiling jobs, recruiting and evaluating employees, and designing academic and professional certification" (Evans, 2002, 25). They have created a common-language for the industry and educators to develop instructional and training tools to prepare students for the workplace. The benefits of skill standards are that they have helped to communicate performance expectations, reform curriculum to correspond with workplace expectations, reduce the gap between student preparation and workplace needs, and establish criteria for assessment, certification, and compliance (Evans; NWCET, 2000). Different from competencies, skill

standards were described as representing a higher-level of knowledge, skills, abilities, and performance (NWCET).

The Northwest Center for Emerging Technologies (2000) sponsored by the National Science Foundation, developed National information technology skill standards for eight career clusters: database development and administration, digital media, enterprise systems analysis and integration, network design and administration, programming/software engineering, technical support, technical writing, and web development and administration. “For skill standards to be effective, they must reflect the consensus of the industry professionals in that career field” (NWCET, 2000, 5). These standards were created from the contributions of expert panels, information technology-based companies, along with the consideration of work functions, technical knowledge, and related employability skills. The standards were separated into a three-tiered system represented by a triangle form. Tier I, the base, is comprised of the necessary foundational skills, knowledge, abilities, and personal qualities. Those foundational and workplace skills focused on mastering basic skills such as information technology use, critical thinking, and the management of time, resources, and information. Tier II encompassed proficiency in technical skills, knowledge, and abilities with Internet techniques, and understanding and trouble shooting issues with hardware and software. Tier III addressed technical skills, knowledge and abilities identified by the information technology industry and unique to organizations. These skills included understanding industry terminology, compliance and legal requirements, organizational practices and protocols for the preparation of leaders dealing with rapid change.

The College Student Affairs Profession and Adoption of Information Technology

"Technological developments and breakthroughs – both via the Internet and personal computers – have occurred with such high-speed frequency over the past few years that keeping up could be a full-time endeavor" (Elling & Brown, 2001, 90). College student affairs professionals have proven their expertise in providing services and programming that positively increase college student success; however, they were lacking expertise in their knowledge and understanding of current information technology and how to effectively use it to influence college student affairs work (Kleinglass, 2005). New visions for practices incorporating emerging information technology had to be created (Ausiello & Wells, 1997) and actualized. It was time for college student affairs professionals to take the initial steps in familiarizing themselves with the various aspects of information technology and mastering at least one. The task was large, especially when dealing with information technology that was continually changing, but the benefits would be worth the time and effort and would contribute to lifelong learning among college student affairs professionals (Elling & Brown, 2001).

This portion of the chapter will introduce what has been written about the college student affairs approach to information technology use by looking at the professional attitudes, its adoption within the field, and suggested proficiencies and standards.

Professional Beliefs and Attitudes

Most publications that addressed college student affairs professionals promoted the consideration of adopting information technology into practice, services and programs. Love and Estanek (2004) believed that critical engagement with information technology and adaptability must be a high priority for every college student affairs professional. Engagement meant the

extension beyond the knowledge of the current technological applications through the interaction, use, assessment, and observation of the impact of information technology on their work. Adaptability meant learning new skills, changing position responsibilities, and incorporating information technology into that same work. Ausiello and Wells (1997) thought that the adoption of information technology would benefit the management of administrative operations resulting in increased quality, efficiency, and effectiveness of services and programs. In turn, that would improve the support for student learning and development.

As managers, college student affairs professionals must understand how information technology can be tailored to influence the operations of the core functions of the department or unit, along with how it impacts the professional roles (Elling & Brown, 2001). Ausiello and Wells (1997) suggested four roles that senior student affairs administrators would have to assume in order to effectively plan for and manage information technology: architects, to develop the vision, goal, and objectives for information technology use; facilitators of change, serving as the champion by sharing information with the community; educators and learners, simultaneously teaching the importance of information technology and learning how to incorporate future trends into practice; and policymakers, addressing the potential legal and ethical issues and developing appropriate policies.

College student affairs professionals are committed to student learning and development. The information technology movement has provided staff with the opportunity to improve learning experiences for students (Kruger, 2005b). Kruger argued that college student affairs professionals were in a position where they could be intentional about creating innovative technology-enhanced learning environments. They also provided the opportunity to connect to

students through features that support community- and relationship-building. The characteristics of today's college students show that they are comfortable with, and spend time using, information technology. College student affairs professionals should further explore meaningful ways to take advantage of the resources to connect to the students (Kruger, 2005b). Ausiello and Wells (1997) stated "… information technology can significantly improve student learning and change the way in which students are educated for years to come" (p. 80).

It is important to recognize that there were concerns with the adoption of information technology and its influence on college student affairs. Some of the initial concerns were voiced by Strong (1994) who stated that this movement could lead to: professionals becoming routinized and impersonal due to reliance on information technology for services and programs; unequal access to resources for professionals and students; and, drained financial resources based on the expensive nature of information technology. Love and Estanek (2004) made a similar observation as Rogers (2003) about the consequences. They stated that there was a possibility of by-products as a result of the adoption of information technology. That is, unanticipated consequences or outcomes could negatively influence or detract from the overall learning experience or purpose of a service and program. Elling and Brown (2001) expressed concern that the expanding technological universe should not sidetrack professionals from their primary obligation to help educate and support the development of students. As Moneta (2005) observed, "technology is seductive" (p. 13), there has been pressure to adopt each new innovation, and it is crucial that college student affairs professionals do not succumb to letting information technology lead the way.

Information Technology Adoption within College Student Affairs

> "The quality of our services to students and others is directly associated with the efficiency and effectiveness of our business process transactions, and increasingly, these processes have become automated through a plethora of technological applications designed for student affairs practices" (Moneta, 2005, 13).

Despite the concerns about adopting information technology, many college student affairs divisions and departments have found ways to incorporate it into their services and administrative processes, and educational prevention outreach. As Kruger (2005b) noted, information technology has transformed the work of college student affairs and higher education experience.

Services and administrative processes. Baier and Strong (1994b) initiated the dialogue about information technology's influence on services and administrative processes by featuring its applications in different functional areas within college student affairs. At the time, it was the definitive work within college student affairs that detailed technological advances within academic advising, financial aid, international service and programs, housing, counseling, career planning, student activities, recreational sports, and health services (Baier & Strong; Engstrom & Kruger, 1997). Since then, the proliferation of web-based student services has further enhanced those functional areas, along with service learning, admissions, orientation, registrar, and bursar (Love & Estanek, 2004). Another area that Dare, Zapata, and Thomas (2005) identified was the growth of distance education and the importance of college student affairs cultivating a relationship with distance education departments to provide additional support services to that student population.

Hanson (1997) believed that information technology's greatest impact would be in college student affairs assessment and evaluation. It would be used to acquire the assessment and evaluation information, understand it, and support the communication of results. As the advancement of information technology continued, college student affairs professionals would be challenged to achieve student-learning outcomes; information technology may be integral in conceptualizing ways to meet the expectations (Engstrom & Kruger, 1997).

Educational prevention outreach. Not only must the college student affairs professionals' learn and understand how to adopt information technology for their own administrative processes, they must also recognize the potential issues and dangers that may be prevalent within the student population for the development of educational prevention outreach and intervention strategies (Elling & Brown, 2001). Student issues that were identified as areas that must be addressed include information technology's influence on identity formation, gaming, Internet addiction, pornography and gambling (Elling & Brown; Kruger, 2005b; Shier, 2005). As Kruger stated, orientation, advising, and other interactions with students are the ideal times to help them understand how to deal with these issues, including distinguishing trustworthy content on the Internet.

While information technology has developed into a frontier for communication and the free exchange of ideas, it also has a dark side with individuals using it for illegal purposes (Hawke, 2001). Copyright or trademark infringement, theft of intellectual property, harassment, privacy, and freedom of expression were several areas, often monitored by the institution, for legal violations (Hawke; Peterson & Hodges, 1997). Recently, the most critical legal issue was illegal file sharing of media (Shier, 2005). In order for college student affairs professionals to

create policies addressing the legal and ethical issues of information technology, they must be familiar with the technologies and students' use on campus (Peterson & Hodges).

College Student Affairs Professionals' Fluency and Standards

The term information technology fluency has not been widely used within the college student affairs literature. Instead terms, such as skills, competency, and proficiency were more common. The technology skills among college student affairs professionals would need to be comprehensive enough that they were able to make decision about information technology that included the development and deployment of a new application, and understanding where to find resources, support, and training (Elling & Brown, 2001). Moneta (2005) identified the importance of college student affairs staff mastering skills to understand students' use of information technology. He also believed that a crucial competency was the ability to analyze departmental needs and work processes. The Council for the Advancement of Standards in Higher Education (CAS) (Dean, 2006) identified characteristics indicative of excellent individual professional practice. Under the professional competency category of general skills, within the Professional Standards for Higher Education, professionals should effectively use information technology for educational and institutional purposes. Each of these statements of proficiency was broad and did not hone into what technological proficiencies benefited them personally and professionally.

Two researchers, Kleinglass (2005) and Kennedy (2003), developed models and listings of proficiencies that met the needs of the college student affairs professional. Kleinglass (2005) presented a tiered proficiency model that illustrated the tools, software and activities that were important for the job. Each tier of skills built onto the next. The inner tier was comprised of the

necessary proficiencies that all should know. Those proficiencies included electronic mail and Internet search activities on a computer desktop. The next tier was described as the basic proficiencies that support the ability to perform information technology tasks with research activities through presentation software, spreadsheets, and web pages. The next tier was defined as valuable proficiencies usually exhibited by a designated specialist. The activities reflected course management tools, listservs, and online library. The outer tier was composed of limited proficiencies held by elite users and those who create new technologies. They would create or manage chat rooms, discussion boards, online classes or meetings through digital imaging applications (Kleinglass).

Kennedy (2003) researched college student affairs professionals' perception of the computing technology skills they possessed and wanted to acquire. Based on the responses of 127 participants in Pennsylvania, he reported on competency levels of 15 computer skills and the importance of those skills in daily activities. Participants identified their most advanced skills as the ability to work with electronic mail, word processing, presentation programs, web browser application, spreadsheet application, and desktop publishing. Six skills that participants stated as areas of no competence were computer programming, mainframe database, statistical programs, web page design, file transfer programs, and operating systems. Overall participants perceived and felt competent with the computing skills they used in daily professional activities.

Suggestions for College Student Affairs Professional and Proficiency Development

As seen, there were numerous expectations for college student affairs professionals to adopt and integrate information technology into services and programs, educate students about the benefits and risks of using information technology, and possess technology proficiencies.

While these expectations were prevalent throughout college student affairs literature, there have only been a few suggestions offered as solutions to prepare the professionals to successfully engage in these activities. The one that has been mentioned consistently, although sporadically, through the years is the graduate professional preparatory program's role in professional development. The suggestion of graduate professional preparation programs incorporating technology education in the curriculum only serves a limited segment of the college student affairs professional population.

Engstrom (1997) argued that learning about the appropriate information technology knowledge, skills, and competencies that enhance the qualities of college student affairs, would be an educational expectation of graduate students. College student affairs graduate professional preparation programs train masters and doctoral students about the complexity of the collegiate environment. There is a gap between what students learn in the graduate setting and information technology needs for success at an institution (Elling & Brown, 2001). As a result of Kennedy's (2003) research, he suggested that graduate professional preparation curriculum be considered as an area for the development of competencies. Graduate students must acquire, at minimum, information technology skills that include: using of electronic mail to communicate with other professionals, using the Internet and CD-ROMS for research purposes, designing web-pages, creating multimedia presentations, participating on a listserv, and distributing and receiving files through a network (Engstrom). Each of these skills could be integrated into student technology-oriented class project, or they could witness them from class instruction or guest lecturers (Elling & Brown).

College student affairs professionals have a role in information technology decisions and use within higher education. Kleinglass (2005) mentioned that professionals are the ones who are driving the change in the technology landscape within college student affairs in collaboration with students, faculty, and other higher education administrators. For this change to be meaningful, she provided several suggestions. Professionals need to engage students through information technology. Through this engagement, they would learn about students' technology expectations. "In order to demonstrate value, professionals need to access and understand how to use technology tools for assessment and relate the information to outcomes, activities, and funding" (p. 36).

In conclusion, professionals must become consultants to decisions made about information technology use for student development and communication. For job efficiency, professionals must be proficient in technology tools, software, and activities. Professional training should be implemented to help individuals understand the function of information technology or to enhance their current skills. Information technology must be integrated into graduate professional preparation curriculum. Finally, information technology may no longer be ignored in college student affairs.

The Literature Review's Connection to the Purpose of the Research

As a result of the literature review, not one identified resource addressed the intent of the research, which was to learn about the current state of information technology use in college student affairs from the information technology leaders' point of view. In order to provide evidence to support the benefit for this research, literature that centered on information fluency, information technology, diffusion theory, technology use among college students, information

technology and its leadership in higher education, and information technology within college student affairs was gathered. Each area provided foundational information and an argument for the reason each exists. Connecting them together resulted in the following discussion.

Many individuals are realizing that understanding information technology is advantageous to their personal and professional lives (Lin, 2002). This value may be seen through the shift within the United States to an information economy that requires a workforce that possesses a high level of technical skills (Evans, 2002). Within higher education, information technology contributes to the infrastructure and services provided (Dodd, 2007). It has the potential to "develop expansive, integrated, and collaborative learning activities for students" (Engstrom & Kruger, 1997, p. 1).

While the potential is high, most professionals need to upgrade their technological skills as new innovative tools are introduced (NRC, 1999). Proficiency in the innovation requires college student affairs professionals to become competent in identifying the application best suited for those tools (Moneta, 2005). College student affairs professionals' attitude toward information technology influences their attitudes and willingness to engage in the discussions and decisions regarding the integration of information technology into programs, services, and the development of policy (Love & Estanek, 2004). "These various motivations to learn more about information technology raise the general question, 'what should everyone know about information technology in order to use it more effectively now and in the future?'" (NRC, 1999). Ideally, the information technology leaders participating in this study helped to answer this question for college student affairs professionals.

Each college student affairs organization should have access to a skilled information technology leader, employed in the department, partnered through centralized information technology department, or contracted through a service agreement (Moneta, 2005, 13). The skill standards applicable to the information technology field help develop leaders through training programs, instructional resources, and activities that prepare them to meet the needs of the department (NWCET, 1999). The participants' experience with the notion of skill standards may serve as insight into how it may be applicable to college student affairs.

CHAPTER 3

METHODOLOGY

Research Purpose

The intent of this research was to learn about the current state of technology use in college student affairs from the information technology leaders' point of view. A mixed methods triangulation design was implemented with the goal of gathering complementary data through the quantitative and qualitative traditions. A questionnaire was administered to measure the behavior, attitude and knowledge of information technology leaders' experience in working with college student affairs professionals. Simultaneously, open-ended questions provided an opportunity for the information technology leaders to respond in further detail to topical areas addressed within the instrument.

Participant Sample

The target sample population for this research study was information technology leaders within, or working with, college student affairs. These individuals worked within college student affairs divisional or departmental offices, and institutional central technology administrative departments. This research focused on their perspective on the skills and abilities of college student affairs professionals. Past studies (Kennedy, 2003; Kleinglass, 2005) asked college student affairs professionals to assess their own technology skills and competencies. By targeting information technology leaders, there was a potential to gain critical insight into what technology

experts viewed as the current status of college student affairs and what was needed to enhance the college student affairs professionals' technology fluency.

To solicit these individuals for participation in the research study, working through professional organizations was the best option. The Association of College and University Housing Officers – International (ACUHO-I) and National Association of Student Personnel Administrators (NASPA) have established a commitment to the promotion of technology within higher education and college student affairs. Each had a membership that had access to information technology leaders within colleges and universities.

ACUHO-I's mission is to serve as "the preeminent professional association dedicated to supporting and promoting the collegiate residential experience…" (Association of College and University Housing Officers – International [ACUHO-I], 2007, 2). This international association's dedication is displayed through the commitment to providing valuable resources to the housing professional membership. ACUHO-I has a promise statement to that membership expressing its pledge to promote professional development and provide opportunities for networking and career development for housing professionals at all levels. Annually, the Association sponsors an Information Technology Conference that caters to members including information technology leaders within housing units (ACUHO-I, 2008). Participants from ACUHO-I were solicited via electronic mail. A solicitation email with a link to the questionnaire was sent to 1,213 individuals classified as chief housing officers, Information Technology Conference attendees, and those who listed information technology as a specialty area within the membership database.

NASPA's mission is "to provide professional development and advocacy for student affairs educators and administrators who share the responsibility for a campus-wide focus on the student experience" (National Association of Student Personnel Administrators [NASPA], n.d.). Through NASPA, two procedures were used to recruit participants. The first procedure involved soliciting participants through the Technology Knowledge Community, which is a subgroup within the organization that focuses specifically on technology matters within college student affairs. A solicitation email with a link to the questionnaire was sent to 439 subscribers (which included NASPA staff members) to the Technology Knowledge Community listserv. The second procedure solicited 400 chief student affairs officers and requested that they forward a letter, with an embedded link to the questionnaire, to information technology leaders within their division and departments. A mailing list of 1174 names was obtained and a stratified random and simple random sampling was implemented. Prior to the sampling, schools located outside of the United States and two-year institutions were removed reducing the population to 889. To conduct the stratified random sample, the list was separated into public (414) and private (475) institutions; then 200 potential participants were selected from each through simple random sampling.

Research Design

The triangulation design-validating quantitative data model was a one-phase design in which both quantitative and qualitative data were collected simultaneously. This design was chosen because it consisted of using one questionnaire instrument to collect quantitative data, along with a limited number of open-ended qualitative questions (Creswell & Plano Clark, 2007). This concurrent procedure allowed for both data types to be gathered, integrated and used

to interpret the findings (Creswell, 2003). The questionnaire primarily focused on obtaining quantitative data that focused on attitude, behavior, and knowledge through close-ended questions, while the qualitative open-ended questions validated and expanded on the quantitative findings (Creswell, 2003; Creswell & Plano Clark, 2007).

There were strengths and challenges in using this research design. The identified strengths were the efficient design that permitted two types of data to be collected at one time and the ability to analyze each data set independently using the approaches indicative of that tradition. The challenges were balancing the data collection method and analysis, along with the ability to resolve data results that conflicted (Creswell & Plano Clark, 2007).

Research Questions

To address the intent of this research, the following research questions were investigated.

1. What do information technology leaders report as the support processes they provide to college student affairs professionals?
2. How do information technology leaders rate the current technological fluency of college student affairs professionals at their institution?
3. How do information technology leaders rate the current technological skills of college student affairs professionals at their institution?
4. How do information technology leaders rate the importance of the development of technology skill standards applicable to college student affairs work?
5. What do information technology leaders believe should be incorporated into educational opportunities preparing college student affairs professionals to work with technology?

Instrument

The primary instrument was a locally-designed questionnaire. This option was chosen due to the unique nature of the research questions and lack of identification of pre-existing instruments addressing this specific topic. The questions were created from a combination of representing concepts identified in the existing literature and researcher's observations. The questionnaire consisted of 23 quantitative and seven open-ended qualitative questions. They were separated into six sections: demographic information, support, information technology fluency, information technology skills, skill standards, and educational opportunities.

Four scales were developed from the variables: the Frequency of Support Scale (Support), the College Student Affairs Information Technology Fluency Scale (Fluency), the Perceived Ability Scale (Ability), and the Perceived Performance Scale (Performance). The sections and topics that had corresponding literature are listed in Table 1.

Administration of the Instrument

The questionnaire was administered during a three week period of time, end of January to mid-February, during the spring 2008 semester. Perseus Survey Solutions 6 software maintained in the Division of Student Affairs at the University of Georgia was used. This software allowed for the instrument to be accessible via the Internet. Participation in this study was voluntary. Participants were required to consent to their participation by entering a password. A copy of the consent was then available to print for their records. The questionnaire was developed so that they were not forced to answer every question or complete the questionnaire. All open-ended responses were optional. At the end of the questionnaire, participants had the option to submit or discard answers. They were also given the option to enter their name for the opportunity to be the

randomly selected recipient of the $50 Amazon gift card. It was impossible to guarantee full confidentiality due to nature of computer-based technology; however, steps were taken to make sure that confidentiality was maintained. Those steps included removing any identifiable information prior to publicly reporting the results and keeping data files in a secure location.

Analysis Procedures

The following information details what was included in the instrument to address each research question and the statistical and qualitative procedures used to measure the data. Based on the stages identified by Creswell and Plano Clark (2007), the first step of the process involved analyzing the data separately, based on the traditional analysis methods. SPSS 11.0 for Windows, the statistical software package, was used to analyze the quantitative data. The qualitative data was analyzed through traditional methods of coding, developing themes, and examining the interrelationship of those themes. The data was then merged to develop a complete picture.

Demographic Information

Information technology leaders were chosen as ideal participants based on their expertise and ability to provide an educated perspective on the research topic. The demographic information gathered included participant background (gender, age, and academic degree attainment), work environment (student population and college student affairs support population), and work experience (employment status, length of time in higher education, work history, and primary work role). Each of these areas was analyzed through frequencies and descriptive statistics. The sample size, mean, and percentage of participants were reported.

Table 1

Instrument Topics of Questions with Corresponding Literature

Section/Topic	Literature
Demographic Information	
Role description	Freeman & Aspray (1999)
Innovation-decision making process	Rogers (2003)
Support	
Technology needs	Kleinglass (2005); NRC (1999)
(excluding blogs, podcasts, social networking, virtual environments)	
Information Technology Fluency	
Fluency definition and Fluency scale	NRC (1999)
Abilities and Ability scale	NRC (1999)
Information Technology Skills	
Adopter category	Rogers (2003)
Technology skills	Kleinglass (2005); NRC (1999)
(excluding blogs, podcasts, social networking, virtual environments)	
Skill Standards	
Skill standard components	NWCET (1999)
Educational Opportunities	
Types of opportunities	Elling & Brown (2001); Kleinglass (2005); NRC (1999)

Research Question 1 – What do information technology leaders report as the support processes they provide to college student affairs professionals?

The purpose of this research question was to measure the information technology leaders' behavior when working with college student affairs professionals. The questions addressed the types of technology-focused support, amount of time, and areas for support that information technology leaders provided. They were developed based on information gathered from Kleinglass (2005), NRC (1999), and NWCET (1999). A categorical and interval response format was used to measure behavior. Statistical procedures used to assess the data were descriptive (mean and standard deviation) for individual variables and the Support scale. Spearman's rank correlation was applied to measure the association between ordinal variables (Huck, 2004).

Research Question 2 – How do information technology leaders rate the current technological fluency of college student affairs professionals at their institution?

The aim of this research question was to measure the information technology leaders' knowledge of college student affairs professionals' technology fluency. The questions focused on the concept of technology fluency and decision-making processes within college student affairs. The literature from NRC (1999) and Rogers (2003) was used to develop the questions. An ordinal response format was used to measure knowledge. The Fluency and Ability scales were collapsed and measured separately with descriptive statistics (mean and standard deviation). Spearman's rank correlation was applied to measure the association of variables within each scale and between the two scales. A crosstabulation, independent Chi-Square test, and Cramer's *V* were applied to assess the relationship between the collapsed variables and between the Fluency and Ability scales.

Research Question 3 – How do information technology leaders rate the current technological skills of college student affairs professionals at their institution?

The intent of this research question was to measure the information technology leaders' knowledge of the technology skills that college student affairs professionals possess. The questions focused on identifying adopter categories and information technology skills among college student affairs professionals. The literature used to develop this portion of the questionnaire was gathered from Rogers (2003), NRC (1999), Kleinglass (2005), and NWCET (1999). A categorical and ordinal response format was used to measure knowledge. Frequencies detailed the categorical variables. The Performance scale was collapsed and measured with descriptive statistics (mean and standard deviation). A crosstabulation, independent Chi-Square test, and Cramer's *V* were applied to assess the relationship between the collapsed variables and between the Performance and Ability scales.

Research Question 4 – How do information technology leaders rate the importance of the development of technology skill standards applicable to college student affairs work?

The goal of this question was to measure the attitude of information technology leaders toward the concept of skill standards. Ordinal scales were used to measure the intensity of attitude. The literature used to develop this portion of the questionnaire was gathered from NWCET (1999). Descriptive statistics were used to analyze the data; frequencies, means and standard deviations were reported.

Research Question 5 – What do information technology leaders believe should be incorporated into educational opportunities preparing college student affairs professionals to work with technology?

The purpose of this question was to measure the information technology leaders' attitude toward the consideration of educational opportunities for college student affairs professionals. Ordinal and categorical scales were be used to measure the intensity of attitude. The questions were developed based on information gathered from Elling & Brown (2001), Kleinglass (2005), and NRC (1999). Questions were posed through a categorical and ordinal response format. Descriptive statistics were used to analyze the data; frequencies, means and standard deviations were reported. Spearman's rank correlation was applied to examine the association of ordinal variables included for educational opportunities options.

Open-Ended Questions

Qualitative open-ended questions were placed throughout the questionnaire in an effort to gather additional data from the participants. These questions supported the succinct and standardized nature of the quantitative data. The open-ended questions captured the more detailed points of view of the participants through the predetermined research questions (Patton, 2002). They were analyzed through a traditional technique of coding the data and grouping the codes into categorical themes (Creswell & Plano Clark, 2007).

Reliability and Validity

In preparation for the research to be conducted, factors of reliability and validity of the instrument were considered. An intraobserver test-retest was used as an indicator of the reliability of the instrument (Litwin, 1995). One individual who worked as an information

technology leader within a college student affairs department completed the questionnaire at two separate times for comparison purposes. This allowed for the assessment of the stability of responses (Litwin). Upon analysis, the respondent provided the same responses to the questionnaire when taken at separate times.

Determining validity within a mixed methods instrument means to draw "meaningful and accurate conclusions from all of the data in the study" (Creswell & Plano Clark, 2007, p. 146). It was important to document the validity, especially for the evaluation of a new questionnaire instrument (Litwin, 1995). Litwin identified two options for internal validity measures: face and content. Face validity was the review of the questionnaire by evaluators untrained in the subject matter for the purpose of assessing if the items and layout were satisfactory. Fifteen colleagues including doctoral students and other college student affairs professionals throughout the United States provided feedback. Ensuring content validity involved soliciting feedback from knowledgeable subject-based reviewers about the appropriateness of the questionnaire items. Obtaining opinions for these individuals helped assess the relevancy of variables included in the instrument (Litwin). This was achieved based on the review from two information technology leaders and a researcher in the subject matter of technology in higher education. For the validity of qualitative responses, peer review was used for the purpose comparing the developed coded categorical themes (Creswell & Plano Clark, 2007; Merriam, 2002).

With the concurrent nature of gathering both qualitative and quantitative data for the triangulation design, several strategies were taken to minimize the potential threat to the validity of the study. The quantitative and qualitative responses were given by the same sample population, matrices were developed with categorical data and qualitative themes, and the

sample provided a large amount of qualitative data with each open ended question (Creswell & Plano Clark, 2007). Also, to ensure external validity numerous statements from participants were included to illustrate the findings and themes (Merriam, 2002).

CHAPTER 4

RESULTS

The intent of this research was to learn about the current state of information technology use in college student affairs from the information technology leaders' point of view. The goal was to survey information technology leaders in order to gain insight into their perspective of the knowledge, skills, and support services that lead to technological fluency among college student affairs professionals. The quantitative and qualitative results from the questionnaire are reported. This chapter begins with an overview of the instrument, analysis of scales, reporting of qualitative results. Following the overview, descriptive statistics of the participant demographics, statistical power analysis, along with statistical and qualitative analysis of the data corresponding with the research questions is presented.

Instrument

The instrument for this research was a locally developed one-phase design that solicited mixed-methods responses through a concurrent triangulation design (Creswell & Plano Clark, 2007). The instrument consisted of 23 quantitative questions from which four scales were developed. The Frequency of Support Scale included 19 statements with five-point optional responses where 1 represented "never," 2 represented "rarely," 3 represented "occasionally," 4 represented "often," and 5 represented "always." The College Student Affairs Information Technology Fluency Scale included three statements with the five-point Likert-type optional responses where 1 represented "strongly disagree," 2 represented "disagree," 3 represented

"neither agree nor disagree," 4 represented "agree," and 5 represented "strongly agree." The Perceived Ability Scale included seven statements and the Perceived Performance Scale included 19 statements. Both scales had five optional responses with 1 representing "only with full assistance," 2 representing "with majority assistance," 3 representing "with some assistance," 4 representing "with very little assistance," and 5 representing "no assistance needed at all." Seven open-ended qualitative questions were included for the purpose of soliciting additional responses and ideas from participants.

Analysis of Scales

The coefficient alpha was used to measure the internal consistency reliability of the four scales. With each scale, an analysis was conducted to determine if a substantial change would occur if an item was removed (Green & Salkind, 2005; Huck, 2004). The alpha scores for each scale were as follows: the Frequency of Support Scale (Support), .9140; the College Student Affairs Information Technology Fluency Scale (Fluency), .8942; the Perceived Ability Scale (Ability), .8943; and, the Perceived Performance Scale (Performance), .8895.

Reporting the Qualitative Results

The triangulation design-validating quantitative data model employed concurrent data analysis and reporting methods (Creswell & Plano Clark, 2007). Two options were used to report the qualitative findings: matrix and narrative. The matrix is used as a visual comparison of the qualitative and quantitative findings. Qualitative themes were transformed and reported in the frequently used quantitative technique of a table format. The matrix included the overall title of themes, the components that illustrated each theme, and direct quotes from participants that

supported the development of the themes. The narrative served as the traditional method for reporting qualitative themes and direct quotes to support them.

Results of Data Analysis

Demographics

There were 180 participants that completed the questionnaire and responded to demographic questions. Those questions were divided into three areas that described each participant's background, work environment, and work experience. The results are shown in Table 2.

Participant background. The information solicited regarding the background of the participants included gender, age, and highest academic degree attained. The information technology leader participants were 32.8% female and 65.6% male representing 177 responses. Three participants either chose not to respond (1.1%) or identified as transgender (0.6%). The ages ranged from 18 to 62 (M = 38.33). They varied in the highest academic degree that each has attained. The majority earned a master's degree (48.9%). Other degrees attained included a bachelor's degree (33.3%), doctoral degree (7.2%), high school diploma (6.1%), associate's degree (3.3%), other (1.1%), and no response (1.1%).

Participant work environment. The work environment questions focused on describing the size of the student population where the participants worked and the number of college student affairs professionals that the participants supported. The majority of participants (55.6%, n = 100) worked at an institution with 10,000 or more students. The remaining categories showed that 26.1% (n = 47) worked at an institution with 3,000-9,999 students, 15.0% (n = 27) at an institution with 1,000-2,999, and 3.3% (n = 6) where the student populations was 0-999.

Table 2

Demographic Characteristics of Information Technology Leaders

Variable	*n*	Percent
Gender		
Females	59	32.8%
Males	118	65.6%
Transgender	1	0.6%
No response	2	1.1%
Highest degree attained		
High school diploma	11	6.1%
Associate's degree	6	3.3%
Bachelor's degree	60	33.3%
Master's degree	86	47.8%
Doctoral degree	13	7.2%
Other	2	1.1%
No response	2	1.1%
Amount of college student affairs professionals supported		
0	12	6.7%
1	1	0.6%
3	3	1.7%
4	5	2.8%
5	3	1.7%

Variable	*n*	Percent
Amount of college student affairs professionals supported		
6	6	3.3%
7	4	2.2%
8	2	1.1%
9	2	1.1%
10	10	5.6%
12	7	3.9%
13	2	1.1%
14	4	2.2%
15	6	3.3%
16	3	1.7%
18	2	1.1%
20	9	5.0%
22	3	1.7%
25	4	2.2%
27	1	0.6%
30 or more	91	50.6%
Length of time as an information technology leader in higher education		
Less than one year	15	8.3%
1	8	4.4%
2	11	6.1%

Variable	*n*	Percent
Length of time as an information technology leader in higher education		
3	9	5.0%
4	12	6.7%
5	17	9.4%
6	12	6.7%
7	15	8.3%
8	10	5.6%
9	9	5.0%
10	13	7.2%
11	6	3.3%
12	4	2.2%
13	6	3.3%
14	8	4.4%
15	5	2.8%
16	2	1.1%
17	2	1.1%
18	3	1.7%
19	1	0.6%
20 years or more	12	6.7%

Variable	*n*	Percent
Work history		
Hired into college student affairs department	129	71.7%
Transitioned from information technology department	26	14.4%
Transitioned from college student affairs department	25	13.9%
Current employment status		
College student affairs division	65	36.1%
College student affairs department	72	40.0%
Central technology administration	26	14.4%
Other	17	9.4%
Primary role		
Supporter/Tender	46	25.6%
Conceptualizer	43	23.9%
Developer	27	15.0%
Modifier/Extender	26	14.4%
Other	38	21.1%

The majority of participants (50.6%, *n* = 91) provided information technology support for 30 or more college student affairs professionals. The remaining participants (49.4%, *n* = 89) supported a range of college student affairs professionals from zero to 27.

Participant work experience. The work experience looked at the description of the current employment status, length of time as an information technology leader in higher education, work history, and the primary work role of the participants. The current employment status of the participants was separated into four categories: work within a college student affairs department office (43.3%, *n* = 78), work within a college student affairs division office (37.2%, *n* = 67), work within an institution's central technology administrative department (14.4%, *n* = 26), other (5.0%, *n* = 9), and independent contract (0%). Participants that selected the "other" category had an opportunity to provide additional information. That qualitative information was separated into the two themes: (1) dual responsibilities to two or more departments or units within the institution, and (2) responsibility to one division or department outside of student affairs.

As for the length of time (in years) as an information technology profession in higher education, the participant responses ranged from less than one year to 20 or more years. The most frequent amount of time spent was five years, representing 9.4% responses (*n* = 17) with a mean score of 7.87. The work history of the participants showed that 71.7% (*n* = 129) indicated that they were hired directly into a college student affairs department, 14.4% (*n* = 26) transitioned from an information technology department to a student affairs department, and 13.9% (*n* = 25) transitioned from a student affairs department to an information technology department.

Lastly, the primary work roles of the participants were based on the categories developed by Freeman & Aspray (1999). Supporters/tenders, those participants indicating that they delivered, installed, operated, maintained, and repaired technological tools for division or department, represented 25.6% (n = 46) of responses. Conceptualizers, those developing ideas to create technological tools for a division/department, represented 23.9% (n = 43) of responses. An "other" category was selected by 21.1% (n = 38). Developers who designed, constructed, and tested a technological tool for a division/department represented 15% (n = 27) of responses. Lastly, 14.4% (n = 26) identified as modifiers/extenders meaning they adjusted or added to existing technological tools for divisional or departmental use.

Statistical Power Analysis

Statistical power was determined through the computer application G*Power 3 (Faul, Erdfelder, Lang & Buckner, 2007). A medium effect size was factored. A sample size that ranged from 82 to 180 was necessary to complete various statistical analyses. Specifically, with an alpha at .05, effect size at .3, and power at .80, a sample size of 82 was needed to conduct a correlation analysis with two tales. For a chi-square analysis, a sample size of 133 was needed with an alpha at .05, power at .80, and four degrees of freedom.

The Spearman's rank correlation was calculated to determine the relationship between the four scales: Support, Fluency, Ability, and Performance. The Bonferroni adjustment technique (Huck, 2004) was applied to control the possibility of a Type I error. A p-value less than .001 (.05/4) was needed for significance to be achieved. This approach resulted in two significant correlations. The correlations occurred between the Fluency and Ability scales (r_s = .481, p = .000), and Performance and Ability scales (r_s = .403, p = .000). In addition, each scale

was collapsed into three categorical variables: low, medium, and high. The differences between the three levels of variables were statistically significant among the Fluency and Ability scales [χ^2 (4, n = 180) = 46.239, p = .000, Cramer's V = .358] and the Performance and Ability scales [χ^2 (4, n = 180) = 33.269, p = .000, Cramer's V = .304].

Findings

Research Question 1

The first research question asked, "What do information technology leaders report as the support processes they provide to college student affairs professionals?" Information technology leaders were asked to respond affirmatively or negatively to whether or not they provided one of three types of support to college student affairs professionals. The majority of participants, over 80%, provided all three types of support. Technical support, also known as troubleshooting, was identified as a service area provided by 84.4% (n = 152) of the sample. Educational support, which focused on introducing new tools and the popular uses of them, was provided by 87.2% (n = 157) of the sample. Training support, in which information technology leaders offered instructions on how to use existing technology, was provided by 83.9% (n = 151).

In addition to the types of support the participants provided, they were also asked to indicate the amount of time they spent providing technical, education, or training support within the past month. The optional responses were separated into a percentage of time with a range that included: 0%, 25%, 50%, 75%, and 100%. The results showed that there was a small amount of variability in each case. The mean and standard deviation scores are noted in the parenthetical notations: Technical support (M = 2.61, SD = 1.080), educational support (M = 2.41, SD = .824), training support (M = 2.18, SD = .815).

The Frequency of Support scale (Support) was created from a 19-item question which concentrated on information technology leaders indicating the support they provided with specific computer applications, hardware use, or actions. A portion of the items was developed from information gathered from existing literature (NRC, 1999; Kleinglass, 2005). The alpha coefficient was .9184 based on those 19 items and 180 responses. The scale was collapsed into three levels of support, low (1), medium (2), and high (3), and each group accounted for approximately 33%. The scale mean was 2.02 (SD = .828). The distribution was nearly even with 32.8% (n = 59) accounting for a low amount of support, 31.7% (n = 57) with a medium amount of support, and 35.6% (n = 64) with a high amount of support provided overall during the past month.

Out of the full listing of 19 items, the five areas that required the highest average amount of support in the past month included: electronic mail (M = 3.45, SD = 1.439), use of the computer to communicate with others (M = 3.41, SD =1.401), database system to develop, access, or manage information (M = 3.32, SD = 1.368), Internet to find information and resources (M = 3.31, SD = 1.422), and word processor applications (M = 3.19, SD = 1.460). The five lowest areas for support were with setting up personal computers (M = 2.14, SD = .1.181), podcasts (M = 1.48, SD = .855), blogs (M = 1.63, SD = 1.014), social networking (M = 1.83, SD = 1.093), and scanning (M = 1.97, SD = 1.116).

When examining the Spearman's rank correlation between the types of support information technology leaders provided in the past month, numerous positive associations were identified. The Bonferroni adjustment technique was used to control for a possible Type I error among the 19 correlations. The p-value had to be less than .002 (.05/19) for significance to be

achieved. This approach produced 130 correlations significant at $p < .002$. There were 21 strong positive correlations with a minimum $r_s = .6$. For example, the highest significant correlation occurred between the variables of set up personal computer and connect computer to network, $r_s = .804$, $p = .000$. The second highest significant correlation between the variables of electronic mail and calendar program, $r_s = .762$, $p = .000$. Additional correlations are provided in Table 3.

The qualitative responses were coded into six themes that provided additional information about the various types of support processes, which were not included within the quantitative information gathered. The majority of the responses fit into six support themes: software, web-based processes, administration, institutional technical and laboratory, assessment and report generation, and audio-visual. These themes reflected the technical support category mentioned earlier. The remaining responses reflected the category of training support. This report of qualitative themes did not include direct quotes from participants. The majority of responses regarding the support services were offered in a list format, rather than in a traditional sentence or paragraph format.

The software theme encompassed third party applications administration, software design and development, and home grown application support. Web-based processes incorporated content management, campus web portal development, and maintenance. Administration was the dominant theme. Information technology leaders stated that they provided support with strategic planning, consulting, project management, emergency notification and social notification systems, custom solutions, policy development, budget management, purchasing, marketing, and business process analysis. Institutional technical and laboratory support included the overall management of student staff technical crew, campus computer laboratories, system

Table 3

Spearman's Rank Correlation for Type of Support Provided in the Past Month ($N = 180$)

Variable	r_s
Basic operating system features	
Internet to find information and resources	.663
Standard spreadsheet application	.690
Electronic mail	.767
Calendar program support	.633
Use computer to communicate with others	.669
Use word processor applications	.777
Internet to find information and resources	
Standard spreadsheet application	.665
Electronic mail	.752
Calendar program	.602
Use computer to communicate with others	.644
Standard spreadsheet application	
Electronic mail	.677
Use word processor applications	.746
Set up personal computer	
Connect computer to network	.825

Variable	r_s
Use word processor applications	
Internet to find information and resources	.684
Electronic mail	.756
Calendar Program	.602
Use computer to communicate with others	.701
Podcast	
Blog	.666
Web page design	
Developing Internet-based services	.623
Electronic Mail	
Calendar program	.772
Use computer to communicate with others	.665

Note. Correlations significant at $p < .002$, two-tailed.

infrastructure, and security (e.g., server, card access, and door access control). The assessment and report generation theme was composed of those two tasks, along with processing scan sheets, pivot tables, charts, and creating federal and state mandated reports. The last theme, audio visual, included the management of surveillance systems, phone, data, television and radio production, and presentation development. The remaining support services fit into the category of training support.

Research Question 2

The second research question examined the question, "How do information technology leaders rate the current technological fluency of college student affairs professionals at their institution?" The information technology fluency of college student affairs professionals was evaluated by two scales, the College Student Affairs Information Technology Fluency Scale (Fluency) and the Perceived Ability Scale (Ability), along with qualitative questions that focused on the types of resources available and ways in which fluency was observed.

The Fluency Scale was created from a three item question that solicited a five-point Likert-type response about the participants' perception of college student affairs professionals' acquisition and use of information technology knowledge. The three variables that equated to information technology fluency were engagement in lifelong learning, application of current information technology knowledge, and acquisition of knowledge to successfully implement information technology (NRC, 1999). The scale was collapsed into three levels of agreement of college student affairs professionals' acquisition and use of information technology: low involvement (1), medium involvement (2), and high involvement (3). The scale mean was 2.144 (SD = .826). This showed that the information technology leaders perceived that, on average, the college student affairs professionals had a medium level of involvement when actively acquiring and using information technology knowledge leading to technology fluency.

Spearman's rank correlation was used to examine the relationship between the three variables of the Fluency Scale. The correlation for the variables engaging in lifelong learning process about information technology and applying existing knowledge to adapt to information technology changes was r_s = .730. The correlation was r_s = .772 for engaging in lifelong learning

and continually acquiring knowledge about information technology. Lastly, the correlation for applying existing knowledge to adapt to information technology changes and continually acquiring knowledge about information technology was $r_s = .737$.

Information technology leaders were asked to provide their perspective on what types of resources were available on their campus to assist the college student affairs professional increase fluency. The responses led to the development of three themes reflecting the resources: training, direct support, and support on specific applications.

Training was provided through a variety of methods and created to reach different populations. One participant stated, "We offer classroom training for our primary technology such as email and our division portal. In addition we offer online training for all Microsoft products like XP, Vista, and Office. When a new technology becomes available, we offer classes." Training methods ranged from formal organized processes to individual support. The methods identified included those offered through the Internet (e.g., references, classrooms, self-directed, on-demand), physical classes (e.g., instructor-led, free or cost, sponsored by institutional entities), group instruction, and conferences. In some cases, third-party software vendors supported the classes. "We have huge opportunities for training and I am encouraged to take whatever classes I see fit or are necessary. I have never been held back from what was needed to progress."

Another identified resource available on campuses was direct support. Based on the responses, direct support was described as that which is provided upon request. One participant provided direct support by supporting "Informal training (one-on-one with me) of specific tools in specific situations. Nothing formalized that is available to all student affairs professionals."

Participants mentioned that divisional consultants, personal training, help desk, and peer support were accessible when solicited. “Our student affairs professionals tend to wish to work with a live person”

The final area was support on specific technology topics and applications. Two statements reflected this belief. “Our technology department within student affairs offers multiple development opportunities on a wide range of technology topics.” “Occasional workshops on technological phenomena related to student affairs, such as Facebook. The campus also offers online technology training via Element K…” The most popular technology topics identified were Microsoft Office applications, facebook.com, survey tools, digital media editing, and calendar programs.

As a follow up to the types of resources available to help college student affairs professionals become fluent in information technology, participants also provided their observations on how fluency was exhibited by those same professionals. The observations were separated into the information technology fluency categories. They were further divided into two qualitative-themed categories of fluency and non-fluency, with subcategories that addressed attitude, behavior/action, and knowledge. The qualitative outcomes and direct quotes from participants are detailed in Table 4. An example of how the table should be interpreted is as follows: college student affairs professionals exhibited information technology fluency when engaging in lifelong learning process through their attitude of acceptance; or, college student affairs professionals show non-fluency through their attitude when they exhibit a lack of interest.

Table 4

Fluency Exhibited by College Student Affairs Professionals

	Fluency		
	Attitude	**Behavior/Action**	**Knowledge**
Engage in lifelong learning process about information technology	• Acceptance	• Seek out assistance • Want to know how to use applications	• Younger professionals are more optimistic and experienced • Involvement in professional development
	"Student affairs personnel tend to be younger, earlier in their careers, perhaps, and have a higher than average use of and interest in technology"		
	"We now have many student affairs professionals that are seeking out our help in using technology in their programs. They are using multimedia, designing websites, creating surveys, etc."		

	Attitude	Behavior/Action	Knowledge
Apply existing knowledge to adapt to information technology changes		• Use more technology • Initiative • Types of applications used	
	"I've noticed that our student affairs professionals seek out technology opportunities and are one of the more progressive departments on campus." "There are a handful of us student affairs people who fit the concept of someone who is information technologically fluent. Some of my peers and myself have used podcasts, blogs, Google calendar, social bookmarking, and social networking sites."		
Continually acquire knowledge about information technology to effectively implement		• Engage in training	• Discussions • Types of questions and inquiries
	"I receive regular inquiries by student affairs professionals across the division about the potential application of one of technologies, or applications, that they hear about in their professional circles." "In responding to requests for information or assistance, it is evident the level of understanding and knowledge of technology."		

	Non-Fluency		
	Attitude	**Behavior/Action**	**Knowledge**
Engage in lifelong learning process about information technology	• Not a Priority • View as a one-time fix	• Choose what to adopt and ignore	• Seasoned professionals not as engaged
	"…Older student affairs professionals seem to prefer to remain ignorant about technology which is a problem and I would think would be a problem professionally for them." "Forced to adopt/adapt to keep up with competitors, and to keep technology relevant to student demographic."		
Apply existing knowledge to adapt to information technology changes	• Opposition • Feel lost with concept	• Difficult understanding the process of technology	• Do not know what to do
	"Many student affairs professionals tend to see any problem that involves technology as a 'technical issue' when, in fact, many of the issue are process related." "My position was recently created. I have learned that a percentage of our staff felt lost in the usage of technologies and had become accustomed to immediately asking for assistance."		

	Attitude	Behavior/Action	Knowledge
Continually acquire knowledge about information technology to effectively implement	• Resistant • Lack of interest	• Do not extend beyond certain applications	• Lack of engagement with training
	"Many are unwilling to learn new technology, are not excited about it, but feel they are forced to use it to stay current. Many do not understand what content goes on to websites, how to format data for the web, and about how to keep data secure." "Most people are reluctant to change, and therefore resistant. Existing knowledge is often a tool to avoid change rather than to adapt to it."		

Note. Information technology fluency categories are displayed in the left column with overarching qualitative themes on the top row. Empty cell reflects no applicable data.

The Ability Scale measured the perceived ability level of college student affairs professionals in seven areas (category title listed in parenthesis): define a technology problem (engage in sustained reasoning), use information technology to communicate (communicate to other audiences), determine if technology will meet a specific need (test a solution), identify appropriate technology for intended use (organize and navigate information structures and evaluate information), collaborate with others through technology (collaborate), learn a new technology (anticipate changing technologies), and think about policies that influence information technology (think about information technology abstractly) (NRC, 1999). The

participants were asked to respond by identifying if the college student affairs professionals were able to complete these seven abilities based on a five-point scale: only with full assistance, with majority assistance, with some assistance, with very little assistance, or no assistance needed at all from information technology leaders. That five-point scale was collapsed into a three-point scale indicating that the perceived ability of the college student affairs professionals was attained with low ability or full assistance needed (1), medium ability or some assistance needed (2), or high ability or no assistance needed (3) from the information technology leaders. The mean score was 2.044 (SD = .803) indicating that the perceived ability level of college student affairs professionals was a medium level with some assistance needed from information technology leaders to attain a degree of fluency.

Spearman's rank correlation was applied to determine the relationship between the Fluency and Ability scales. The correlation was significant at $r_s = 0.481$ ($p < .01$). The relationships between the variables were positively weak to moderate. Table 5 provides further description of the variables of each scale and the relationships. All variables were significant.

Table 5
Spearman's Rank Correlation Between Variables of the Fluency and Ability Scales (N = 180)

	Lifelong learning	Apply knowledge	Acquire knowledge
Able to:			
Define technology problem	.480	.418	.481
Use information technology effectively to communicate	.441	.382	.387
Determine if proposed technology meets needs	.305	.276	.293
Find, evaluate, and design information technology	.338	.263	.349
Collaborate remotely with others through information technology	.345	.298	.321
Learn a new technology and adapt to it	.403	.327	.308
Think about information technology's influence on policy	.324	.296	.295

Note. Correlations significant at $p < .01$, two-tailed

In addition, a crosstabulation, independent chi-square test, and Cramer's V were applied to the collapsed Ability (low ability/need full assistance, medium ability/need some assistance, and high ability/need no assistance) and Fluency scales (low, medium, and high). Low fluency was divided between low ability (53.7%), medium (26.6%), and high ability (6.5%). Medium fluency was split between low ability (20.4%), medium ability (43.8%), and high ability (24.2%). High fluency was split between low ability (25.9%), medium ability (29.7%), and high ability (69.4%). The differences between the three levels of variables were statistically

significant [χ^2 (4, n = 180) = 46.239, p = .000, Cramer's V = .358]. Overall, the results support the descriptive statistical measurements of each scale and the relationships between the two.

Research Question 3

How do information technology leaders rate the current technological skills of student affairs professionals at their institution? In an effort to understand the type of skill set college student affairs professionals possess, information technology leaders were asked to provide their perception on the technology adoption characteristics and performance of specific computer applications, hardware use, or actions. Qualitative questions were included to solicit additional information about the technology skills needed for the current and future success of college student affairs professionals.

The description of the majority of college student affairs professionals, based on the perception of adoption of technology, were divided into five categories: Laggards, late majority, early majority, early adopters, and innovators (Rogers, 2003). There were 180 responses with four responses categorized as a missing value. Information technology leaders provided their viewpoint about the majority of college student affairs professionals with whom they worked with. The descriptions of each are provided and Table 6 details the frequencies. Laggards were those who were suspicious and resistant toward technology. The late majority waited for the critical mass to favorably critique a new technology. Early majority were deliberate and understood the influence of a given technology before adopting it. Early adopters adopted technology earlier than the critical mass. Lastly, the Innovators were those college student affairs professionals who were venturesome with technology.

Table 6

College Student Affairs Adopter Categories

Variable	*n*	Percent
Laggards	29	16.1%
Late Majority	66	35.7%
Early Majority	35	19.4%
Early Adopters	35	19.4%
Innovators	11	6.1%
No response	4	2.2%

The Perception of College Student Affairs Performance scale (Perform) was created from 19 items which concentrated on information technology leaders indicating their perception of the performance ability of college student affairs professionals with specific computer applications, hardware use, or actions (NRC, 1999; Kleinglass, 2005). The items in this scale mirrored the items included in the Frequency of Support scale. There were 180 responses received and the alpha coefficient was .8895. The scale was collapsed into three levels: low performance or full assistance needed (1), medium performance or some assistance needed (2), or high performance or no assistance needed (3) from the information technology leaders. The scale mean was 2.005 (*SD* = .815) indicating that the perceived performance of college student affairs professionals is at a medium level with some assistance needed from information technology leaders.

In addition, a crosstabulation, independent chi-square test, and Cramer's V were applied to the collapsed Performance (low/need full assistance, medium/need some assistance, and high /need no assistance) and Ability scales (low/need full assistance, medium/need some assistance,

and high/need no assistance). Low performance was divided between low ability (55.9%), medium (16.4%), and high ability (18.3%). Medium performance was split between low ability (28.8%), medium ability (45.9%), and high ability (31.7%). High performance was split between low ability (15.3%), medium ability (37.7%), and high ability (50.0%). The differences between the three levels of variables were statistically significant [χ^2 (4, n = 180) = 33.269, p = .000, Cramer's V = .304].

Information technology leaders were asked to provide their perspective on what technology skills were needed for college student affairs professionals to be successful in their current jobs and in the future. In both cases, the responses corresponded with the same five themes. There has to be a certain type of attitude, skill level, ability, overarching knowledge, and experience with specific computer applications. More information on the themes is provided in Table 7, which compares the current and future skills needed with the five themes, along with direct quotes that encompass the nature of the theme.

Table 7

Technology Skill Needs for Success in Current and Future Jobs

Themes	Skills	
	Current job	**Future**
Attitude	• Willingness to learn • Desire to adapt	• Openness/willingness to adapt • Change as technology changes • Initiative
	Current job: "I think the most important technology skill is to be open to new ways of doing things. Our population students are beginning to demand that we communicate in a different way. Things are changing rapidly." Future: "Being willing to change as technology changes!!!!!!! Explore new IT resources and how they can benefit what they do. Take advantage of current I T resources and see how they can benefit what they do."	
Skill Level	• Advanced • Basic	• Advanced (Internet) • Intermediate (Operating system) • Basic proficiencies (Programming knowledge) • Diversified technology background

(Skill level continued)

Current job: “Understanding of basic productivity tools (word processing, spreadsheet, presentation, graphics, as well as communication tools (Email, content creation for websites).”

“Advanced knowledge of productivity software and the ability to efficiently use an email system”

Ability

- Communicate with staff and students
- Find resources
- Database management
- File/Data management
- Evaluate current technology
- Marketing

- Communication with staff, students
- Find resources
- Web page design
- Adapt to new technologies
- Conceptualizing what technology can do for them
- Cope with technology changes
- Think creatively with technology
- Assessment

Current job: “The ability to see technology within the 'big picture' of educational needs and institutional goals. In the past, technology was used to manage student records. Today, it is also a critical communication tool used to attract prospective student interest and move them to enrollment.”

	(Ability continued) "…Tools such as databases, spreadsheets, and data mining." "Learn how to Query your information systems –Microsoft Access." Future: "Tomorrow's student affairs professional is going to be adept at using technology in both a broad sense and have a focus on the use of technology in the areas of communication. Student affairs departments need to start investing in high end technology support that include technology professionals as partners, not as hired help."	
Overarching Knowledge	• Technology trends • Productivity tools • Communication tools • Value of technology standards • Terminology • Copyright laws	• Current and future technology trends (among students) • Content Management System • Possible solutions that technology provides • Internet for new projects • What can and cannot be performed with technology • Information technology/Data security compliance policies • Business process analysis – From analysis to selecting the appropriate technology

	(Overarching knowledge continued) Current job: "Understanding terminology and acronyms" "They need to be able to predict how technology may affect their business practices." Future: "You can teach people skills, but the most important is how to teach them how to think creatively with vision, that is the greatest technological skill, to see no limits with the technology at hand. Technologists of the future need to have exposure to many programs and become native consumers of technology in general so when they sit down to any platform/program"	
Computer Applications	Electronic mail, Word processing Instant messenger, Social networking sites, Spreadsheets, Presentation programs, Statistical software (e.g., SPSS), PeopleSoft, FrontPage, Dreamweaver	Electronic mail, Word Processing Instant Messenger, Social Networking Sites, Spreadsheets (advanced budget skills), Presentation Programs (e.g., Microsoft PowerPoint), Blog, Wiki, Podcasts, Web-based surveys, Search driven web environments vs. traditional structured web pages, mobile technology, Web 2.0

Research Question 4

How do information technology leaders rate the importance of the development of technology skill standards applicable to student affairs work? Information technology leaders were asked several types of questions to gather additional data regarding technology skill standards. Their attitudes toward skill standards were measured by a five-point Likert-type scale and affirmative or negative responses. They were asked if technology skill standards should be considered, the potential benefit of its inclusion, the content, and possible application within the college student affairs profession.

The consideration of technology skill standards and the benefit of those standards to the college student affairs profession received a large affirmative response from the participants. Those responses showed that 79.4% (n = 143) of 163 participants believed that technology skill standards should be considered for the profession, 11.1% (n = 20) disagreed. Similarly, 86.1% (n = 155) of 168 participants believed that technology skill standards would be beneficial, 7.2% (n = 13) disagreed.

The highest response to the idea of separate technology skill standards for varying college student affairs functional areas (e.g., campus activities, judicial affairs, housing) was 48.3% in agreement. The mean was 3.60 (SD = 1.096). Those that strongly agreed represented 18.3% (n = 33), 16.1% (n = 29) disagreed, 12.8% (n = 23) neither agreed nor disagreed, and 4.4% (n = 8) strongly disagreed. The highest response to the idea of separate technology skill standards for varying levels of experience (e.g., entry-level, mid-level, senior-level) was 46.1% (n = 83) in agreement. The mean was 3.66 (SD = 1.058). In a similar pattern, 20.6% (n = 37)

strongly agreed, 15.6% (*n* = 28) disagreed, 15.0% (*n* = 27) neither agreed nor disagreed, and 2.8% (*n* = 5) strongly disagreed.

There were four items (NWCET, 1999) provided for consideration within the potential technology skill standards for college student affairs: Performance indicators, technical knowledge, employability skills, and tasks that supported future technical knowledge. More than 50% of respondents believed that each category should be a factor in skill standards. The identification of performance indicators to determine if a task was satisfactorily completed received 56.7% (*n* = 102) agreement. Those that neither agreed nor disagreed represented 23.3% (*n* = 42) of participants, 10.6% (*n* = 19) strongly agreed, 8.3% (*n* = 15) disagreed, and 1.1% (*n* = 2) strongly disagreed. Standards that focus on technical knowledge focusing on skills, abilities, and tools received 70.0% (*n* = 126) agreement. Those that neither agreed nor disagreed represented 15.6% (*n* = 28) of participants, 12.2% (*n* = 22) strongly agreed, 1.7% (*n* = 3) disagreed, and .6% (*n* = 1) strongly disagreed. Standards that addressed employability skills focusing on functional area competencies received 61.1% (*n* = 110) agreement. Participants that strongly agreed represented 18.9% (*n* = 34) of the sample, 16.1% (*n* = 29) neither agreed nor disagreed, 2.8% (*n* = 5) disagreed, and 1.1 % (*n* = 2) strongly disagreed. Lastly, standards that identified tasks that addressed technical knowledge used in the future received 60.0% (*n* = 108) agreement. Those that neither agreed nor disagreed represented 23.3% (*n* = 42) of participants, 13.9% (*n* = 25) strongly agreed, 2.2% (*n* = 4) disagreed, and .6% (*n* = 1) strongly disagreed.

Information technology leaders were asked to provide their perspective on what skill standards should be considered for the student affairs profession. The question solicited

responses that could be separated into acceptance or rejection based on the four main categories that corresponded with the skill standards categories. Results are reported in Table 8.

Table 8

Information Technology Skill Standards to Consider

	Acceptance	Rejection
Performance indicators to determine if a task is performed well		• College student affairs is too broad "I think it's too broad to set standards for this group overall."
Technical knowledge that focus on skills, abilities, and tools	• Office productivity software • Communication applications • Survey development applications • Web design applications "Technology skill standards should not be set. There is too much diversity of need within higher education and student affairs specifically. Standards don't make sense."	• Different needs
Employability skills that focus on competencies associated with a functional area	• Understand what is needed for each job "Standards would vary based on the position. Many units are hiring specialist such as marketing, web designers to take what we know best and translate to the different medias out there."	• Do harm

	(Employability skills continued) "Difficult gauge – each college and university's need can be very different. By lumping everyone with one technology skill standard, you can do more harm than good."
Tasks that support future use of technical knowledge	• Conduct research • Troubleshoot simple errors • Adapt to new technology • Database management • Terminology • Student trends • Personal information security "Understanding of digital media security (confidentiality, availability and consistency) is foundational." "Beyond the basic office caliber suite, which I would include a basic understanding of database functions. I would also strongly recommend exposure to search/Internet search/research skills, and critical thought capacity to the application of technology to a business/services/instructional circumstance."

Note. Empty cell reflects no applicable data.

Research Question 5

What do information technology leaders believe should be incorporated into educational opportunities preparing student affairs professionals to work with technology? The last research question addressed the types of technology-focused educational opportunities that may be beneficial for college student affairs professionals. With a five-point Likert-type scale, information technology leaders were asked to share their attitude toward six different types of educational options. Each option produced the following percentage agreement from participants: discovery learning through experimentation (62.2%, n = 112, M = 3.81, SD = .866) (NRC, 1999), active learning through tutoring (69.4%, n = 125, M = 4.02, SD=.598), graduate professional preparation programs (40.0%, n = 72, M = 3.28, SD = .982), full day training (47.2%, n = 85, M = 3.48, SD = .924), brown bag-lunch sessions (61.1%, n = 110, M = 3.76, SD = .801) (Kleinglass, 2005), or books and other literature (36.7%, n = 66, M = 3.01, SD=1.046).

Other participants' attitude toward discovery learning resulted in 15.6% strongly agreeing, 10.6% neither agreeing nor disagreeing, 10.6% disagreeing, and 1.1% strongly disagreeing. Attitude toward active learning resulted in 16.7% strongly agreeing, 12.2% neither agreeing nor disagreeing, 1.7% disagreeing, and no responses that strongly disagreed. Response to graduate professional preparation programs was that 31.1% of participants neither agreed nor disagreed, 17.2% disagreed, 7.2% strongly agreed, and 4.4% strongly disagreed. Other participants responded to the concept of full day training with 25.0% neither agreed nor disagreed, 16.7% disagreed, 10.0% strongly agreed, and 1.1% strongly disagreed. The value of the bag lunch sessions had 18.3% neither disagreed nor agreed, 12.2% strongly agreed, 7.2% disagreed, and 1.1% strongly disagreed. With the last option, books and other literature, 30.0%

disagreed, 22.8% neither agreed nor disagreed, 6.7% strongly disagreed, and 3.9% strongly agreed that it is a viable educational opportunity.

Spearman's rank correlation was examined between the types of technology-focused education opportunities. The Bonferroni adjustment technique resulted in a *p*-value less than .008 (.05/6) for significance to be achieved. This approach produced four significant correlations. Those correlations were between: graduate professional preparation programs and full day training (r_s =.391, p = .000), books and other literature and graduate professional preparation programs (r_s =.391, p = .000), books and other literature and bag-lunch series (r_s =.228, p < .002), and books and other literature and discovery learning through own experimentation (r_s =.223, p < .003).

Information technology leaders shared their opinions about where the primary responsibility of educating college student affairs professionals should fall. Out of 180 responses, 168 provided specific recommendations and 12 indicated that they did not know. The suggestions and percentage of participants that responded were as follows: Information technology leaders directly working with college student affairs (47.2%, n = 85), college student affairs professionals (20.0%, n = 36), institutional information technology leaders (13.3%, n = 24), supervisors of college student affairs professionals (6.1%, n = 11), graduate professional preparation programs (4.4%, n = 8), professional organizations (2.2%, n = 4), and 6.7% (n = 12)indicated that they did not know.

Information technology leaders were asked to provide additional information on what they thought should be incorporated into the educational opportunities. The question solicited responses and resulted in the creation of three categories: types of training, educational topics, and tools. Results are shown in Table 9.

Table 9

Considerations for Educational Opportunities

Types of training	• Hands on training • Contextual relevance to student affairs and their jobs • Practical application (demonstrations, hands on experiences, examples, stories, documentation) • Tailor training to each functional area and all levels of staff • Process of technology, not tools • Determined by information technology on campus • Upon request • On-site training • Training for "power users" • Reinforcement of foundation knowledge • Conferences that cater to information technology and college student affairs "Training geared to level of prior knowledge. For example I have attended software training sessions only to waste my time because the instructor taught to the person, who did not know how to open a program or click on a menu." "Hands-on experiences, review and discussion of what others are doing, more presentations at professionals associations on technology use & ideas, training skill building."

(training continued)	"…encouragement and additional training for 'power users' who could provide leadership in their own departments."
Educational topics	• The use of technology for communication • How students are using technology, what they are using • How student affairs professionals help students see other uses for technology • How to collaborate with others to reduce duplicate efforts • General skills applicable for any office "I think an emphasis should b placed on the use of technology in communication." "Have classes offered that relate to the use of new releases of office products that most of us use, such as Office 2007 and the VISTA."
Tools	• Competency assessments • Incentive to complete training "Budget out training and competency assessment in different areas." "Skills testing in which a competency level must be reached prior to acceptance into the graduate program with further competency testing demonstrating growth in this area prior to graduation."

Summary

The intent of this research was to learn about the current state of information technology use in college student affairs from the information technology leaders' point of view. A one-phase questionnaire soliciting quantitative and qualitative responses was used to survey 180 participants. The questionnaire included 23 quantitative questions and seven opened-ended qualitative questions.

Analysis focused on five areas: support processes, technological fluency, technological skills, technology skill standards, and educational opportunities. In addition, four scales were developed from the questionnaire items. The scales were the Frequency of Support Scale, College Student Affairs Information Technology Fluency Scale, Perceived Ability Scale, and Perceived Performance Scale. Descriptive statistics were used to analyze the overall data. Spearman's rank correlation was used to analyze the relationships between the ordinal variables and scales.

The findings showed that over 80% of the information technology leaders reported providing technical, educational, and training support to college student affairs professionals with specific computer applications, hardware use, and action items. College student affairs professionals exhibited fluency, and lack of it, through their attitude, behavior/action, and knowledge.

Many college student affairs professionals were categorized as late majority adopters. The consideration of technology skill standards and the benefit of those standards to the profession received a majority affirmative response from the participants; however, dissension was voiced through qualitative results. Finally, information technology leaders directly working

with college student affairs and college student affairs professionals were identified as the two groups primarily responsible for supporting educational opportunities that promote the acquisition and development of technology skills and fluency.

CHAPTER 5

CONCLUSIONS

Overview

The purpose of this research was to learn about information technology leaders' perspective of technology use within college student affairs. Measuring their attitude, belief and knowledge served as a foundation for developing a mixed methods description of the relationship of college student affairs professionals and information technology. Information technology leaders provided insight into their categorization of college student affairs professionals based on experiences through the support they provide, evaluation of the information technology fluency, skills, and abilities, and opinion of the factors to be considered for educational needs and skill standards (Evans, 2005; Kleinglass, 2005; NRC 1999; NWCET, 2000; Rogers, 2003).

This chapter will support the benefit of this research by providing and discussing the analysis of findings, potential limitations, along with the implications and future consideration of the connection of information technology and college student affairs. It will conclude with suggestions for future research in an effort to continue the dialogue of this time-sensitive and influential topic.

Analysis of Findings

Both quantitative and qualitative data were collected. Based on the mixed methods analysis suggestions (Creswell & Plano Clark, 2007), the following section will address how the

quantitative and qualitative data converge, confirm each other, support each other, and the similarities and differences.

The Role and Management of Information Technology within Higher Education

Information technology leaders serve in a critical role in the management of higher education (Hawkins & Marcum, 2002) and college student affairs. The 180 participants provided information about their specific roles and responsibilities. The analysis of the overview of participant background is important because it provides a framework of understanding through which the participants answered the questions.

The average work experience, as an information technology leader in higher education, was approximately seven years and most provided support to 30 or more college student affairs professionals. Based on the Freeman and Aspray (1999) definitions of information technology leader roles, the majority of participants' primary role was categorized as *supporters/tenders* with the responsibility of delivering, installing, operating, maintaining, and repairing technological tools. They primarily worked in a college student affairs department or divisional office, with an additional fraction assigned to dual responsibilities between two or more departments. The primary innovation-decision making process of choice within their department or division was the *authority approach* indicating that decisions to adopt or reject a technology were based on their expertise (Rogers, 2003).

Research Question 1: What do information technology leaders report as the support processes they provide to college student affairs professionals?

Information technology leaders provided technical, educational, and training support to college student affairs professionals. Nineteen types of support provided in the last month,

initially identified by Kleinglass (2005) the National Research Council (1999), and the researcher were measured. The use of electronic mail, the computer to communicate with others, a database system to develop, access, or manage information, the Internet to find information and resources, and word processor applications were the areas that required the most amount of support. Numerous significant correlations and positive relationships were noted. Support with basic operating system features had the most relationships. It correlated with the following variables: Internet to find information and resources, standard spreadsheet application, electronic mail, calendar program, computer to communicate with others, and word processor applications.

The qualitative data confirm that the majority of additional support processes that information technology leaders provided continued to fit under the technical and training support category. Software, web-based processes, administration, assessment, and audio-visual were the major themes. Although they were considered to be additional support processes that were not included on the listing given within the questionnaire, two areas were related to those same variables: web-based processes and assessment. The first area, web-based processes, incorporated the content management, campuses web-portal development and maintenance relates to the variable developing Internet-based services. The second area, assessment and report generation, which relates to the variable technology for assessment needs. These variable areas did not correlate with the majority of variables, except that developing Internet-services had a statistically significant correlation with web page design. This shows that although it was not recognized in the past as an important measure, it should be considered in the future.

The findings mentioned above denote several conclusions. The first conclusion is that college student affairs professionals appear to have a handle on some technology aspects. There

are several technology tasks and abilities that continue to require support. The need for support in certain technological areas has not changed since last identified by other researchers. Those areas continue to center around the basic operating system and the applications that accompany it (e.g., standard productivity applications). The second conclusion is that support has grown along with the new trends in areas that are integral to the success of college student affairs including assessment, web design and content management, Internet-based services, and communicating through technology channels. The third conclusion is that the technology areas that have become extremely popular in today's society, especially among college students, are not a major factor and do not require a greater amount of support. Those areas included blogs (web-based journal), podcasts (digital audio) and social networking.

Research Question 2: How do information technology leaders rate the current technological fluency of college student affairs professionals at their institution?

According to the data, the fluency of college student affairs professional is rated at a medium level with some assistance needed from information technology leaders. The medium level represents two factors. The first is their engagement in lifelong learning, application of existing information technology knowledge to adapt to changes, and the continual acquisition of knowledge to effectively implement information technology (NRC, 1999). The second is their perceived ability level to define a technology problem, use information technology to communicate, determine if technology meets a specific need, identify appropriate technology for intended use, collaborate with others through technology, learn a new technology, and think about policies that influence information technology (NRC). Technological fluency is determined by the Fluency and Ability scales, defined above. A significant correlation and

independent chi-square test resulted in a positive association between the scales showing that they are good indicators of fluency. Although the average response reflects the idea that student affairs professionals fall into the middle of a low and high level of involvement and ability with some assistance needed, there is a belief among information technology leaders that there is a range of fluency. One participant mentioned, "There are 3 categories…1) those who want to learn 2) those who are stuck in their ways and are afraid of technology, and 3) those who think they know, but don't." Another participant stated, "Some tend to stay on the leading edge, while some are late adopters. Their fluency is bell-shaped."

Through the qualitative data, information technology leaders report ways in which information technology fluency is promoted among college student affairs professionals and how they exhibit it. Three themes were developed regarding types of resources available on campus to promote fluency which included training, direct support, and support on specific applications. Training opportunities are available through formal classroom instruction, Internet, conferences, and in some cases are provided by third-party vendors. Direct support represents informal individual training or training provided upon request. Support for specific applications addresses the college student affairs professional's need for additional information on technology topics and computer applications. Those which are the most commonly mentioned are Microsoft Office, social networking site facebook.com, calendar programs and survey tools. One participant summed up the types of resources by stating, "We have a professional center, with on-demand online lessons, scheduled basic, intermediate and advanced software usage classes, as well as hand out lesson books."

Information technology leaders also report that college student affairs professionals exhibit fluency, and lack of it, through attitude, behavior/action, and knowledge. One participant stated, "Student affairs professionals need help with their technology in varying degrees. All are capable of learning the new processes and procedures as they develop, but many times need encouragement to learn and adapt to changing technologies and processes."

Elling and Brown (2001) believed that college student affairs professionals need to have a comprehensive knowledge of technology in order to make decisions that are grounded in the understanding of how to identify resources, support, training, along with developing and deploying new applications. This corresponds with what NRC (1999) identified as the components necessary for achieving information technology fluency. There is an agreement between the college student affairs and information technology literature regarding fluency. The current state, according to the information technology leaders, conflicts with this ideal and has yet to be attained. Portions of the fluency components may be currently on the minds of college student affairs professionals, (e.g., learning about new technology), but the others are not intentionally incorporated into their work mindset. One participant mentioned, "Fluency runs from 'adequate' to 'none' with the very rare fluent. Fluent younger professionals just out of college are becoming somewhat more common but it is still more common to find young professionals that are unwilling." Another mentioned, "Student affairs professionals typically adopt new tech based on their perceptions of student acceptance or media coverage. I rarely see them interested in evaluating technology for its value, or innovating by thinking about how certain technology could be used." There is a divide between the actual fluency level of college student affairs professionals and suggestions for what is needed to be classified as fluent.

However, the qualitative reflections illustrate that visible steps are being made through the report of available campus resources and ways college student affairs professionals are demonstrating various components of information technology fluency.

Research Question 3: How do information technology leaders rate the current technological skills of college student affairs professionals at their institution?

The skills of college student affairs professionals are rated at a medium performance level with some assistance needed from information technology leaders. This is determined by the Perceived Performance scale measured by nineteen variables, same as the Support scale, which includes specific computer applications, hardware use, or actions (Kleinglass, 2005; NRC, 1999). Additional insight into the skill level is reflected through the categorized description of the majority of college student affairs professionals. Based on Roger's (2003) adopter categories, college student affairs professionals are considered to be the *late majority*, meaning that they wait until the critical mass favorably critiques a new technology and uncertainty has been removed before adopting a new technology or practice. "I find most seasoned professionals to be fairly resistant to technological changes." Although category titles are not mentioned in the questionnaire, one participant stated "some tend to stay on the leading edge, while some are late adopters." Being described as a *late majority* or *late adopter* serves as one explanation as to why college student affairs professionals are rated as needing some assistance with their technology skills.

For college student affairs professionals to be successful in their current jobs and in the future, information technology leaders identify several skills that are necessary. Five themes were created from the qualitative responses. The participants believed that there must be a

certain type of attitude, skill level, ability, overarching knowledge, and experience with technology. As one participant stated, “Attitude is important.” In order for success to be achieved, the attitude must reflect a willingness to learn and adapt to the technology changes. Skill levels may vary between basic and advanced, but there is an expectation that success is rooted in the comprehension of standard productivity tools. The most prominent ability themes are communicating through technology, finding resources, conceptualizing and evaluating technology capacity, and assessment. Overarching knowledge addresses technology terminology, trends, solutions, security, and what can be accomplished. Lastly, success requires college student affairs professionals to become proficient in computer applications that include electronic mail, spreadsheets, presentation programs, social network sites and web design. One participant summed it up well by stating, “More exposure to the wide variety of technology (both hardware and software) that can improve efficiency. Reduce paper files in favor of database technologies so data can be analyzed for a better ‘big picture’ view.”

Information technology leaders identify college student affairs professionals as having a medium skill level and consistently needing some assistance with technology tasks. NRC (1999) reported that most professionals need to upgrade their technological skills. For this to happen, participants provide some suggestions for current and future success through an open-ended response. Interestingly, those suggestions correspond with several statements identified in the literature. Love and Estanek (2004) and Ausiello and Wells (1997) believed that college student affairs professionals should assume an attitude of adaptability, and critical engagement with and adoption of technology. Kleinglass (2005) identified tiers entitled “necessary,” “basic,” “valuable” and “limited skills” levels that include computer applications such as presentation

software, spreadsheets, web design and electronic mail. Baier (1994) concluded that professionals need an overarching knowledge of technology and its uses in order to take advantage of its innovation.

These findings provide a distinct description of where college student affairs professionals fit into the information technology culture. As a member of the *late majority*, this categorization reveals that these professionals will continue to delay the adoption of technology until uncertainty is removed. This point of view also influences the skill acquisition, performance and engagement in activities that contribute to attaining fluency. Although the category defines college student affairs professionals in one manner, the suggestions of skills needed for current and future success provide a guide. This guide will help to advise college student affairs in how to approach the technology adoption process and transition from temporary avoider to willing participant.

Research Question 4: How do information technology leaders rate the importance of the development of technology skill standards applicable to student affairs work?

The consideration of technology skill standards and the benefit of those standards to the college student affairs profession receive a majority affirmative response from the participants. Separating skill standards into the functional areas and varying levels of experiences are rated as beneficial. More than 50% of the information technology leaders believe that performance indicators, technical knowledge, employability skills, and tasks that support future technical knowledge should be a factor in skill standards (NWCET, 1999).

Those who thought the inclusion of skill standards would be beneficial offer suggestions for what should be considered. For technical knowledge, standard office productivity software,

communication, survey development and web design applications should be considered. For example, one participant offered the following statement, “Everyone should be able to communicate via email, word processing, Microsoft PowerPoint, etc. Additionally, student affairs professionals need to determine if other mediums can assist with getting their message across such as podcasts, web-based applications, etc.” For employability skills, it is advantageous to determine what is needed for each functional and experience level. Lastly, tasks that support future use of technology knowledge should include items such as database management, knowledge of trends, and security.

Although a large percentage of participants agree with the idea of skill standards through the quantitative questions, many voice dissenting opinions through the open-ended questions. Those who reject the idea of skill standards offer reasons. First, the profession of college student affairs is too broad to apply performance indicators. Second, the functional areas require different needs for skills, abilities and tools. Third, standards defining employability skills can cause more harm than assistance. “I’m not sure there is a skills standard that would cover the demands that the student affairs profession is going to be asked to cover in the future.”

Just as the participants beliefs about the development and implementation of skill standards vary, the literature does as well. NWCET (1999) acknowledged both sides of the argument. They recognize that identifying competencies would not necessarily meet the institutional need but would add value to the employees and their career advancement. They, along with Evans (2005), also recognized that standards create a common-language that guides work expectations, education and training, and assessment efforts.

According to the findings, the adoption and implementation of skills standards will create a lively conversation within college student affairs. The information technology leaders provided clear beliefs supporting both sides of the discussion. The question is whether or not to consider skill standards; if so, should they be developed based on functional areas or experience levels? Regardless of the decision, those skills which are identified to be incorporated into the skill standards still need to be factored into any future steps. The reason behind this statement is the fact that those skills are the same technology areas distinguished throughout this research, specifically standard office productivity software, database management, assessment, and communication through technology. In addition, those technology areas popular in today's society, such as blogs, podcasts, and virtual environments, should also be a factor.

Research Question 5: What do information technology leaders believe should be incorporated into educational opportunities preparing student affairs professionals to work with technology?

Information technology leaders have the largest percentage of agreement with the following educational opportunities. In order from largest to the smallest they are: active learning through tutoring, discovery learning through experimentation, brown bag lunch sessions, full day training (Kleinglass, 2005), and books and other literature. A significant correlation occurs between five categories of the types of technology-focused educational opportunities: discovery learning through own experimentation, graduate professional preparation programs, full day training, brown bag lunch sessions, and books and other literature. In most cases, the highest correlations occurred with books and other literature serving as one of the variables.

Information technology leaders specify types of training, educational topics, and assessment tools that should be incorporated into educational opportunities. The types of training

include opportunities for practical application, hands-on experiences, and conferences. For example, one participant suggests, "I'm a huge believer in practical example, Learn by seeing application. Demonstrate a technology on a related task and guide the learning through adoption of the technology and developing context to apply this new knowledge to their work." Educational topics include communication options through technology, students' use, and general skills. Another offers the idea of "Integration of the learning and the professionals' responsibilities in a properly timed and paced delivery schedule based on accelerated learning principles would be ideal." Tools primarily address assessments for competency levels and skills testing.

In the literature, one of the most consistently identified areas for educational opportunities are graduate professional preparation programs (Elling & Brown, 2001; Engstrom, 1997; Kennedy, 2003). Contrary to this viewpoint, graduate professional preparation programs are rated as one of the lowest categories regarding the entities that should maintain the primary educational responsibilities. Instead, information technology leaders directly working with college student affairs and college student affairs professionals are identified as the two groups primarily responsible for promoting and supporting those educational opportunities.

Information technology leaders identify numerous educational opportunities and topics to train college student affairs professionals to work with technology. These findings show that the best educational methods are active learning through tutoring and discovery learning through experimentation; however, the adoption of one or combination of several could be just as beneficial. This also shows that information technology leaders recognize the importance of their role in supporting and actively participating in the technological education of college student

affairs professionals. They believe that the college student affairs professionals also must be proactive in that learning. Finally, there is no expectation that other individuals, such as graduate program faculty or direct supervisors, are responsible for the primary educator roles in this area.

Limitations

There were several limitations that influenced the research process: solicitation of participants, time, computer software, types of questions, instrumentation, and generalizability. First, the solicitation of participants who are defined as information technology leaders within, or working with, college student affairs. No one professional organization, electronic listserv, or database was identified as a central location to request participation; therefore, several strategies had to be implemented in order to gain access to this population. Those procedures included solicitation methods through a third party (chief student affairs officers and chief housing officers), various mailing options (paper mail, electronic mail), and multiple professional organizations (NASPA and ACUHO-I). Due to the process that the professional organizations directed, no reminder notifications were allowed to be sent and a second paper mailer was costly. It also did not allow for the calculation of response rate. There was no method to identify how many individuals received the request or forwarded it.

The second limitation is the time limit, timing of the questionnaire, and access. The questionnaire was accessible on the Internet for a condensed period of time, approximately three weeks. In addition, participants were asked to answer several questions based on their experiences of the past month. The questionnaire was released during the last week of January, limiting their responses to experiences in the first semester or quarter of 2008, and during a time after the traditional winter break and observed United States Federal holiday, Dr. Martin Luther

King Jr.'s birthday. Accessing the questionnaire required a password which was included in the consent form in red. Even though it was accented with a different font color, I received approximately 10 emails requesting the password. This may have limited the participation; however, there is no way to gauge how many individuals did not participate based on their inability to identify the password.

The third limitation is the questionnaire software. Perseus Survey Solutions 6 encountered two potential glitches during the data collection phase. It did not generate data for one variable that was included on the questionnaire. That variable, virtual environments, was a part of a question that mirrored an earlier one and was supposed to be used for comparisons. Also, it may have forced answers to optional questions that were identified in a qualitative response. It is unconfirmed; however, during the questionnaire development and test phases, the computer program changed answers from optional to mandatory. That particular issue was fixed and tested, but still may have resurfaced.

The next limitations were the types of questions and instrumentation. As mentioned earlier, it was locally-designed and composed of information gathered from the literature. The questions reflected many key concepts mentioned in the literature, but it was not comprehensive. Additional concepts appeared in the qualitative responses, such as issues of privacy and security. These equally important ideas were not included in the quantitative questions. Even though several methods were used to confirm the instrument's validity and reliability, neither the instrument nor the scales encountered a rigorous test-retest process on a wide ranging level prior to its release.

Participants were asked to provide quantitative and qualitative responses based on their knowledge, belief and attitude toward the topic. The application of external validity or generalizability is not straight forward due to the nature of gathering mixed methods data that focused on the perception of the information technology leaders. Perceptions and experiences inhibit the ability to make general inferences to the larger population because it is not standardized. The time of year, staff composition, or type of popular technology ~~or~~ may influence the perception from one semester to the next. Also, it may not reflect the actual abilities of the college student affairs professionals since no assessments were implemented to test their skills.

Implications

"Student affairs personnel know enough about technology to be dangerous. They really don't understand why or how most programs work and do not take the time to learn more. Most people know just enough to do their jobs." Information technology leaders were asked to participate in this research because of their expertise. They are the most logical resource available to provide a snapshot of technology use among college student affairs professionals and understand what should be considered to successfully transition the profession into one that is technologically fluent. The findings, outlined above, have future implications for both college student affairs professionals and information technology leaders. The implications address the concept of advanced learning for specific technology applications and concepts, skill standards, FITness, and the development of opportunities for partnerships between information technology and student affairs.

Advance Learning for Specific Technology Applications and Concepts

Through the various suggestions provided by the information technology leaders, specific applications and concepts are mentioned repeatedly. Those identified items serve as the foundation of this implication for future practice. According to the information technology leaders, college student affairs professionals must have at least a basic skill level with electronic mail, standard office productivity tools (e.g., word processing, spreadsheet, and presentation programs), instant messenger, social networking sites, web page design and content management, and communicating through technology. A more advanced level in each of these areas is more beneficial, but the basic level is a place to start. Programs for future success are knowledge of and skill in blogs, wikis, podcasts, mobile technology, statistical software, and assessment tools.

Database management, systems, functions and spreadsheets is one overarching area that is crucial to current and future success. This is the one skill that is mentioned the most throughout the open-ended questions pertaining to success in current positions and future, along with a topic area for skill standards. Mentioned over 30 times, the following statements reflect the sentiments expressed. One participant stated, “Spreadsheets. Too many use Excel to hold rows and columns of text when that’s not the purpose.” Another stated, “A better understanding of enterprise level database system, so professionals know what large database applications are capable of and how to ask the right questions to leverage a system to streamline a process.”

Another area is security. Although not mentioned as many times as database knowledge and skills, it is a time-sensitive matter. College student affairs professionals need to understand the factors that influence the security of data and personal information. This requires further

knowledge of backing up data, encrypting files, monitoring access to private information, and understanding what is necessary to ensure that information is not compromised by external or internal sources.

Skill Standards

The potential of implementing information technology skill standards applicable to college student affairs is another future consideration and conversation. As previously mentioned, the research participants had different opinions regarding the establishment of it. In order to facilitate that conversation, an example of a pyramid of competencies for college student affairs has been created to reflect that which was developed by the Northwest Center for Emerging Technologies (1999). The original NWCET pyramid was arranged with three tiers that moved from foundational skills and workplace competencies to industry specific skills, always taking into the consideration skills, knowledge, and abilities.

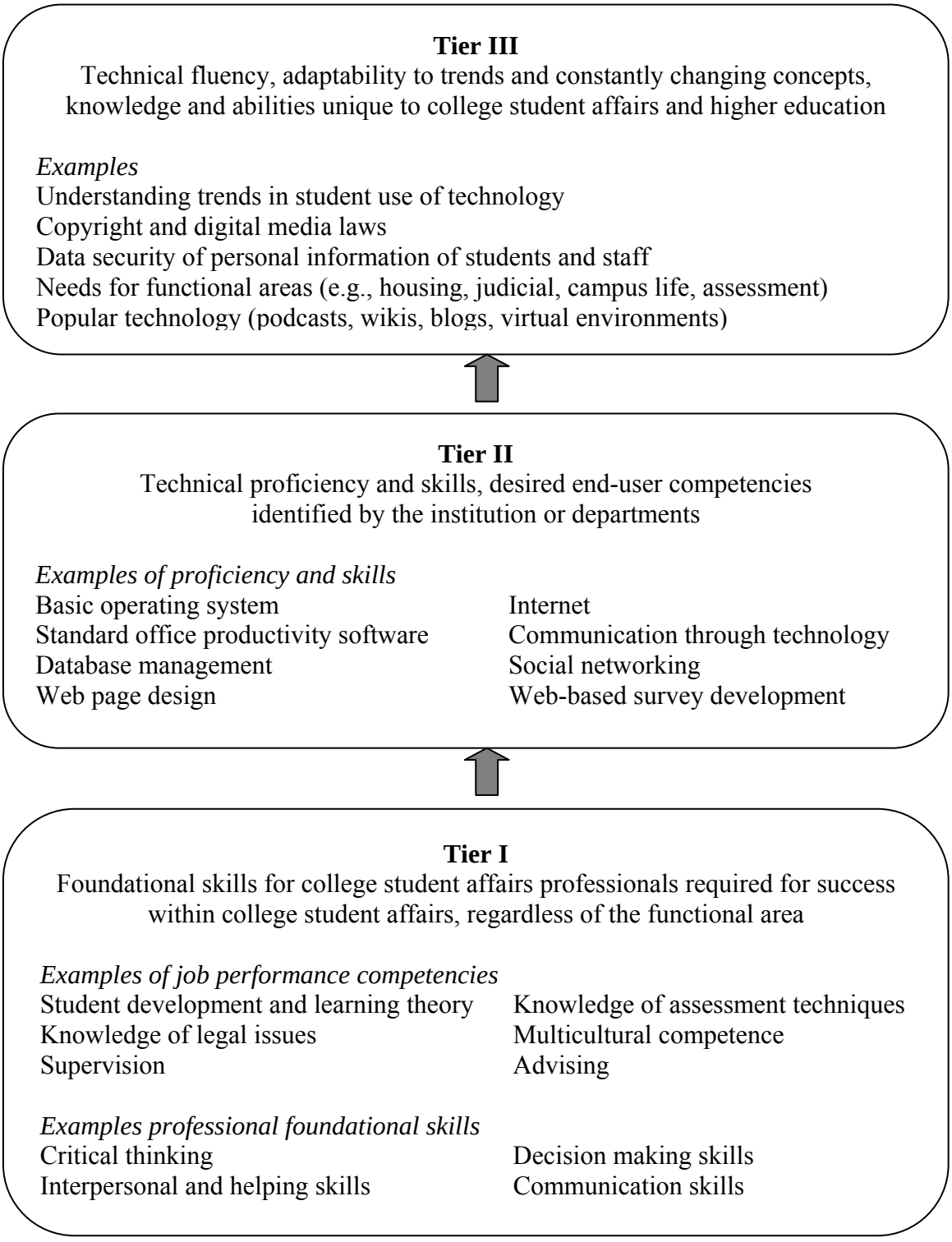
The proposed three tier system for college student affairs is developed from the data collected through this research (Figure 1). Tier I, foundational skills and workplace competencies, focuses on the skills, knowledge, and abilities necessary to be successful in the student affairs profession. The first tier does not address specific technology use; however, it centers on the components that the profession values such as student development and learning theory, interpersonal and helping skills, assessment, legal issues, critical thinking and decision making skills, multicultural competence, supervision, and advising, to name a few. These requisite skills, knowledge, and abilities are taught through graduate professional preparation programs, reinforced on the job, and promoted by professional organizations. The thought of incorporating technology into practice can not be seriously examined unless professionals have

mastered these foundational areas. As a profession, the components of Tier I are usually required for the majority of hiring decisions within college student affairs, regardless of the functional area. Therefore, it is possible for the discussion of skill standards to begin at the second tier.

The Tier II addresses the skills, knowledge, and abilities that are technical and common across all professions that use information technology. Some of these competencies are identified by the information technology leaders. It includes proficiency in basic operating system features and the applications that relate to it, such as, Internet and standard office productivity software. It also includes understanding how to communicate through technology, adapt to technology changes, and manage databases. Tier II focuses on desired end-user competencies that are identified by the institution. The components that are included into Tier II are the competencies and skills that should be outlined in the position descriptions (Kesner, 1998), and supported through training opportunities.

Tier III addresses those technical skills, knowledge and abilities that are unique to college student affairs and higher education. It focuses less on specific technology applications and tools and more on the knowledge of how technology fits into the overall picture. This tier is often the most rapidly changing (NWCET, 1999). Taking that into account, the current areas that should be considered are understanding trends in student use of technology, copyright and digital media laws, and data security of personal information of students and staff. This is also the place where professional organizations that support specific functional areas, like ACUHO-I, are able to assess their functional needs and determine if standard technology expectations may lead to success.

Figure 1. Suggested skill standards tiered system for college student affairs.



Note: Figure adapted from NWCET (1999).

Effective skill standards are the result of consensus between those developing and establishing them for the college student affairs profession. As indicated, there is dissension among the responses provided by the information technology leaders. It is important to consider the idea of skill standards as an option because many participants thought that it could be beneficial to the future success of college student affairs. If the concept of skill standards is rejected an alternative is to consider the development of professional outcomes with the use of technology. Regardless, the conversation may have to begin at the campus level and then extend to the larger profession through professional organizations.

FITness

"I mostly see people opposed to new technology because they don't understand it and are scared of change." FITness, also referred to as fluency with information technology, is a solution to helping individuals adapt to technology changes, and appropriately evaluate, distinguish, learn, and use information technology (NRC, 1999). As mentioned in the second chapter, the purpose of information technology fluency is to extend beyond literacy and adopt a technology mentality which is more comprehensive. The successful adoption of FITness means to combine the ability to use technology, comprehension of the opportunities and limitations of technology, and application of technology to address needs (NRC). The previous implications may lead to that comprehensive nature. Through the data analysis and findings, information technology leaders' perception and opinions outlined what is needed to satisfy the FITness. In fact, the previous implications combined with the hands-on training serve as a blueprint of what strategies may support college student affairs professionals in the quest for FITness.

Partnerships Between Information Technology and Student Affairs

These research findings provide an opportunity for collaboration. This topic of identifying what is needed to transition college student affairs into a fluent profession can be lost if one group is solely responsible for initiating the process. As seen in the responses to who should be primarily responsible for the educational process, both information technology leaders and college student affairs professionals are the top selected. A partnership ties all of the components together to jump-start the next phase of taking this information from research to practice. There are numerous ways in which a partnership can be approached, but what is most important is that it begins on the local level or smaller group. The partnership can occur on the departmental, divisional, or campus level promoted by the leadership or through grassroots efforts. It can also be encouraged through a "call to action" by professional organizations via subcommittees. Ultimately, it is about advancing each college student affairs professional to a FITness level that is appropriate for success in their positions.

Recommendations for Future Research

There are several recommendations for future research that concentrate on college student affairs professionals and information technology. This research focused on support processes, information technology fluency, information technology skills, skill standards, and educational opportunities. Topical areas that should be considered for further study center the age of college student affairs professionals, existing training modules (best practices), adoption rate of technology, skill standards (assessment), security, and the information technology leadership position within college student affairs.

Many information technology leaders who participated in the study mentioned that age was a factor that influenced college student affairs professionals' willingness to adopt and adapt to changing technology, or how technology was used. For example the following statements were made: "Student Affairs personnel tend to be younger, earlier in their careers, perhaps, and have a higher than average use of and interest in technology;" "Younger professionals expect and are more accepting. Older resist unless they can find a personal gain;" and, "Younger staff grew up with advanced technology, so using computer is like reading the newspaper to them. However, email, surfing the Internet, or running a blog is not the same as having real world experience in completed projects, development cycles, design, etc." There is an opportunity to research how age, especially as the Net Generation enters into the profession, influences information technology use within college student affairs. Another area could be how information technology influences their approach to the profession. As noted through the comments, the new professionals and current graduate students have primarily lived their lives with technology.

The information technology professionals discussed a variety of training and education options that are currently available, along with ideas of the best methods for implementing it. A second area for further research is a study on the best practices of existing training or education modules that cater to college student affairs or higher education professionals. Similar to that concept is the possibility of researching the development of a program, implementing it and then assessing its outcomes.

The third area for further research is the adoption rate of technology within college student affairs based on Roger's Diffusion of Innovation (2003). That text provides a

comprehensive look at the adoption of technology, or innovation, and the characteristics that influence it. This model has been applied to other professional areas. It would be interesting to see how it applies within college student affairs and the comparison of adopter categorizations with those other areas.

The fourth area for consideration is the concept of skill standards. With such opposite perspectives provided by the information technology leaders, this topic is ripe for further study. Research could look at college student affairs professionals' beliefs and attitudes toward the concept. The skill standards used in this study were a product of the information technology literature. Further research could focus on the intersection of that information technology-based concept and its potential relationship to the existing professional standards within college student affairs.

Certain departments within college student affairs have access to personal information that requires additional data security. According to some of the qualitative responses, the lack of technology knowledge among professionals leads to the inability to ensure that the privacy of student, alumni, and staff information with which they are entrusted. Therefore, it is recommended that this area be included as a part of future training through literature and practical application.

Lastly, further research about the amount of college student affairs departments and divisions have information technology leaders working within their units would be beneficial. During the data collection process, numerous emails were received from individuals apologizing for not being able to participate because the offices or divisions did not have an information

technology leader. Further research could investigate the types of institutions that typically have or do not have this position, the reasons why, and the benefits and challenges.

Conclusions

An information technology leader stated, it is "important to communicate that technology touches every single activity in which they participate at their jobs, and that the more they understand how technology is implemented and used, the better they can leverage that knowledge in decision making." The goal of this research was to gather data that would provide information that would help to contribute to the transition of college student affairs into an information technology fluent profession. It focused on obtaining feedback from the professionals, information technology leaders, with the greatest amount of expertise. Those leaders provided essential information that will help college student affairs professionals and other information technology leaders *operationalize* the development of functional processes that address the growing need to establish experience and the ability integrate information technology into practice. This research is the initial step. Information technology is a rapidly changing component within today's society and higher education. With that said, future research will contribute to the profession by helping the professionals maintain current knowledge of the technological processes and necessary skills needed for continued success.

REFERENCES

Agee, A. S., & Zenelis, J. G. (2002). Technology across the curriculum: Information literacy and IT fluency. In B. L. Hawkins, J. A. Rudy, & W.H. Wallace, Jr. (Eds.), *Technology everywhere: A campus agenda for educating and managing workers in the digital age*. EDUCAUSE Leadership Strategies No. 6 (pp. 93-110). San Francisco: Jossey-Bass.

Aspray, W., & Freeman, P. A. (2002). The supply of IT workers in the United States. In B. L. Hawkins, J. A. Rudy, & W.H. Wallace, Jr. (Eds.), *Technology everywhere: A campus agenda for educating and managing workers in the digital age.* EDUCAUSE Leadership Strategies No. 6 (pp. 3-24). San Francisco: Jossey-Bass.

Association of College and University Housing Officers – International. (2007). *ACUHO-I strategic plan.* Retrieved March 30, 2008 from http://www.acuho-i.org/Portals/0/pdf/ACUHO-I_Strategic_Plan_%20July_2007.pdf

Association of College and University Housing Officers – International. (2008). *2008 Information technology conference*. Retrieved March 30, 2008 from http://www.acuho-i.org/Default.aspx?tabid=200

Ausiello, K., & Wells, B. (1997). Information technology and student affairs: Planning for the twenty-first century. In C. M. Engstrom & K. W. Kruger (Eds.), *Using technology to promote student learning: Opportunities for today and tomorrow*. New Directions for Student Services, No. 78, (pp. 71-81). San Francisco: Jossey-Bass.

Aviles, K., Phillips, B., Rosenblatt, T., & Vargas, J. (2005) If higher education listened to me…[Electronic Version]. *EDUCAUSE Review, 40*(5), 16-29.

Baier, J. L., (1994). Assessing and enhancing technological competencies of staff. In J. L. Baier & T. S. Strong (Eds.), *Technology in student affairs: Issues, applications, and trends* (pp. 15-26). Lanham, MD: American College Personnel Association.

Baier, J. L., & Strong, T. S. (1994a). Implications for the future. In. J. L Baier & T.S. Strong (Eds.). *Technology in student affairs* (pp. 237-242). Lanham, MA: American College Personnel Association.

Baier, J. L., & Strong, T. S. (Eds.) (1994b). *Technology in student affairs: Issues, applications, and trends*. Lanham, MD: American College Personnel Association.

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

Bowman, R. L., & Cuyjet, M. (1999). Incorporating technology: A comparison of preparation program training and student affairs practitioners' expectations. *College Student Affairs Journal 18*(2), 12-23.

Committee on Workforce Needs in Information Technology. (2000). *Building a workforce for the information economy.* Washington, DC: National Research Council.

Creswell, J. W. (2003). *Research design: Qualitative, quantitative, and mixed methods approaches (2nd ed.).* Thousand Oaks, CA: Sage.

Creswell, J. W., & Plano Clark, V. L. (2007). *Designing and conducing mixed methods research.* Thousand Oaks, CA: Sage.

Dare, L. A., Zapata, L. P., & Thomas, A. G. (2005). Assessing the needs of distance learners: A student affairs perspective. In K. Kruger (Ed.), *Technology in student affairs: Supporting student learning and services.* New Directions for Student Services, No. 112, (pp. 39-54). San Francisco: Jossey-Bass.

Dean, L. A. (Ed.). (2006). *CAS professional standards for higher education* (6th ed.). Washington, DC: Council for the Advancement of Standards in Higher Education.

Dodds, T. (2007). Information technology: A contributor to innovation in higher education. In. T. S. Glickman & S. C. White (Eds.), *Managing for innovation*. New Directions for Higher Education (pp. 85-95). San Francisco: Jossey-Bass.

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

Duderstadt, J. J., Atkins, D. E., & Van Houweling, D. (2002). *Higher education in the digital Age: Technology issues and strategies for American colleges and universities.* Westport, CT: American Council on Education and Praeger.

Elling, T. W. (1997). *Information technology: A planning for a new dawn* [PowerPoint presentation]. Retrieved September 6, 2007 from http://www.uncc.edu/stuaffairs/ naspa/index.htm

Elling, T. W., & Brown, S. J. (2001). Advancing technology and student affairs practice. In R. B. Winston Jr., D. G. Creamer, T. K. Miller, & Associates (Eds.), *The professional student affairs administrator: Educator, leader, and manager* (pp. 81-104). New York: Routledge.

Engstrom, C. M. (1997). Integrating information technology into student affairs graduate programs. In C. M. Engstrom & K. W. Kruger (Eds.) *Using technology to promote student learning: Opportunities for today and tomorrow*. New Directions for Student Services, No. 78, (pp. 31-44). San Francisco: Jossey-Bass.

Engstrom, C. M., & Kruger, K. W. (1997). Editors' notes. In C. M. Engstrom & K. W. Kruger (Eds.) *Using technology to promote student learning: Opportunities for today and tomorrow*. New Directions for Student Services, No. 78, (pp. 31-44). San Francisco: Jossey-Bass.

Evans, N. (2002). Information technology jobs and skill standards. In B. L. Hawkins, J. A. Rudy, & W.H. Wallace, Jr. (Eds.), *Technology everywhere: A campus agenda for educating and managing workers in the digital age.* EDUCAUSE Leadership Strategies No. 6 (pp. 25-38). San Francisco: Jossey-Bass.

Facebook. (2006). Facebook fact sheet. Retrieved October 30, 2007, from http://www.facebook.com/press/info.php?factsheet

Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39*, 175-191.

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

Freeman, P. A., & Aspray, W. (1999). The supply of information technology workers in the United States [Electronic Version]. Washington, DC: Computing Research Association.

Green, S. B., & Salkind, N. J. (2005). *Using SPSS for Windows and Macintosh: Analyzing and understanding data* (4th ed.). New Jersey: Pearson Education Inc.

Greene, J. C., Caracelli, V. J., & Graham, W. F. (1989). Toward a conceptual framework for mixed-method evaluation designs. *Educational Evaluation and Policy Analysis, 11*(3), 255-274.

Hanson, G. R. (1997). Using technology in assessment and evaluation. In C. M. Engstrom & K. W. Kruger (Eds.), *Using technology to promote student learning: Opportunities for today and tomorrow*. New Directions for Student Services, No. 78, (pp. 31-44). San Francisco: Jossey-Bass.

Hawke, C. S. (2001). *Computer and internet use on campus*. San Francisco: Jossey-Bass.

Hawkins, B. L., & Marcum, D. B. (2002). In B. L. Hawkins, J. A. Rudy, & W.H. Wallace, Jr. (Eds.), *Technology everywhere: A campus agenda for educating and managing workers in the digital age.* EDUCAUSE Leadership Strategies No. 6 (pp. 39-49). San Francisco: Jossey-Bass.

Houghton Mifflin Company. (2005). The American heritage dictionary of the English language (4th ed.). Boston, MA: Houghton Mifflin.

Huck, S. W. (2004). *Reading statistics and research* (4th ed.). Boston, MA: Pearson Education Inc.

Johnson, R. A., Mitrano, T., & Vernon, R. D. (2003). Meeting the cybersecurity challenge. In P. A. McClure (Ed.), *Organizing and managing information resources on your campus.* EDUCAUSE Leadership Strategies Series No. 7 (pp. 93-111). San Francisco: Jossey-Bass.

Katz, R. N. (1999). Competitive strategies for higher education in the information age. In R. N. Katz & Associates (Eds.), *Dancing with the devil: Information technology and the new competition in higher education* (pp. 27-49). San Francisco: Jossey-Bass.

Katz, R. N., & Rudy, J. A. (1999). Editors' notes. In R. N. Katz & J. A. Rudy (Eds.) *Information technology in higher education: Assessing its impact and planning for the future*. New directions for institutional research (pp. 1-8).

Kennedy, D. P. (2003). Computing skills needed by student affairs administrators: Using 'high tech' tools in a 'high touch' field. Ed.D. dissertation, University of Pittsburgh, United States -- Pennsylvania. Retrieved July 23, 2007, from ProQuest Digital Dissertations database. (Publication No. AAT 3097656).

Kesner, R. M. (1998). Rethinking the campus work culture in an era of information technology enablement. *Journal on computer in higher education*, *9*(2), 3-30.

King, K. P. (2002). *Keeping pace with technology: Educational technology that transforms* (vol. 2). Creeskill, NJ: Hampton Press, Inc.

Kleinglass, N. (2005). Who is driving the changing landscape in student affairs. In K. Kruger (Ed.), *Technology in student affairs: Supporting student learning and services.* New Directions for Student Services, No. 112, (pp. 25-38). San Francisco: Jossey-Bass.

Komives, S. R., & Petersen, R. J. (1997). Values and principles guiding technology decision making for the future. In C. M. Engstrom & K. W. Kruger (Eds.), *Using technology to promote student learning: Opportunities for today and tomorrow*. New Directions for Student Services, No. 78, (pp. 83-95). San Francisco: Jossey-Bass.

Kruger, K. (Ed.). (2005a). *Technology in student affairs: Supporting student learning and services.* New Directions for Student Services, No. 112, (pp. 103-107). San Francisco: Jossey-Bass.

Kruger, K. (2005b). What we know and the difference it makes. In K. Kruger (Ed.), *Technology in student affairs: Supporting student learning and services.* New Directions for Student Services, No. 112, (pp. 103-107). San Francisco: Jossey-Bass.

Lin, H. S. (2002). IT fluency: What is it, and why do we need it? In B. L. Hawkins, J. A. Rudy, & W.H. Wallace, Jr. (Eds.), *Technology everywhere: A campus agenda for educating and managing workers in the digital age.* EDUCAUSE Leadership Strategies No. 6 (pp. 39-49). San Francisco: Jossey-Bass.

Linden Labs. (2003). *Second life product fact sheet.* Retrieved October 30, 2007, from http://s3.amazonaws.com/static-secondlife-com/corporate/ProductFactSheet.pdf

Litwin, M. S. (1995). *How to measure survey reliability and validity*. Thousand Oaks, CA: Sage.

Love, P.G., & Estanek, S.M. (2004). *Rethinking student affairs practice.* San Francisco: Jossey-Bass.

McClure, P.A. (2003). Managing the complexity of campus information resources. In P. A. McClure (Ed.), *Organizing and managing information resources on your campus.* EDUCAUSE leadership strategies series no. 7 (pp. 1-15). San Francisco: Jossey-Bass.

Merriam, S. B., & Associates. (2002). *Qualitative research in practice: Examples for discussion and analysis*. San Francisco: Jossey-Bass.

Moneta, L. (2005). Technology and student affairs: Redux. In K. Kruger (Ed.), *Technology in student affairs: Supporting student learning and services.* New Directions for Student Services, No. 112, (pp. 3-14). San Francisco: Jossey-Bass.

Moneta, L. (1997). The integration of technology with management of student services. In C. M. Engstrom & K. W. Kruger (Eds.), *Using technology to promote student learning: Opportunities for today and tomorrow*. New Directions for Student Services, No. 78, (pp. 5-16). San Francisco: Jossey-Bass.

National Research Council. Committee on Information Technology Literacy. (1999) *Being fluent with information technology*. Washington, DC: National Academy Press.

National Association of Student Personnel Administrators. (n.d.). *About NASPA.* Retrieved November 11, 2007, from http://www.naspa.org/about/index.cfm

Neal, J. G., & McClure, P. A. (2003). Organizing information resources for effective management. In P. A. McClure (Ed.), *Organizing and managing information resources on your campus.* EDUCAUSE leadership strategies series no. 7 (pp. 29-44). San Francisco: Jossey-Bass.

Northwest Center for Emerging Technologies. (1999). *Building a foundation for tomorrow.* Bellevue, WA: Bellevue Community College Printing Services.

Oblinger, D.G., & Oblinger, J.L. (2005). Is it age or IT: First steps toward understanding the net generation [Electronic version]. In D.G. Oblinger & J.L. Oblinger (Eds.), *Educating the net generation* (pp. 2.1-2.20).

Patton, M.Q. (2002). *Qualitative research and evaluation methods* (3rd ed.). Thousand Oaks, CA: Sage.

Penrod, J. I. (2003). Building an effective governance and decision-making structure for information technology. In P. A. McClure (Ed.), *Organizing and managing information resources on your campus.* EDUCAUSE leadership strategies series no. 7 (pp. 15-28). San Francisco: Jossey-Bass.

Petersen, R. J., & Hodges, M. W. (1997). Legal, ethical, and policy issues. In C. M. Engstrom & K. W. Kruger (Eds.), *Using technology to promote student learning: Opportunities for today and tomorrow*. New Directions for Student Services, No. 78, (pp. 31-44). San Francisco: Jossey-Bass.

Reimer, K. (2005). Integrating technology into the curriculum. In. M. O. Thirunarayanan & A. Perez-Prado (Eds.). *Integrating technology in higher education* (pp. 47-61). Lanham, MD: University Press of America.

Roberts, G. (2005). Technology and learning expectations of the net generation [Electronic version]. In D.G. Oblinger and J.L. Oblinger (Eds.), *Educating the net generation* (pp. 3.1–3.7).

Rogers, E. M. (2003). *Diffusions of innovations* (5th ed.). New York: Free Press.

Schuh, J. H., & Upcraft, M. L. (2001). *Assessment practice in student affairs: An applications manual*. San Francisco: Jossey-Bass.

Shea, P. A. (2005). Serving students online: Enhancing their learning experience. In K. Kruger (Ed.), *Technology in student affairs: Supporting student learning and services.* New Directions for Student Services, No. 112, (pp. 15-24). San Francisco: Jossey-Bass.

Shier, M. T. (2005). What we know and the difference it makes. In K. Kruger (Ed.), *Technology in student affairs: Supporting student learning and services.* New Directions for Student Services, No. 112, (pp. 77-88). San Francisco: Jossey-Bass.

Smallen, D. L, & McCredie, J. (2003). Getting beyond budget dust to sustainable models for funding information technology. In P. A. McClure (Ed.), *Organizing and managing information resources on your campus.* EDUCAUSE Leadership Strategies Series No. 7 (pp. 45-58). San Francisco: Jossey-Bass.

Strange, C. C., & Banning, J. H. (2001). *Educating by design: creating campus learning environments that work.* San Francisco: Jossey-Bass.

Strong, T. S. (1994). The technology and information explosion. In. J. L Baier & T.S. Strong (Eds.). *Technology in student affairs* (pp. 3-26). Lanham, MA: American College Personnel Association.

Tapscott, D. (1998). *Growing up digital*. New York: McGraw-Hill.

Windham, C., (2005). Father Google and mother IM: Confessions of a net gen learner [Electronic Version]. *EDUCAUSE Review, 40*(5), 42-59.

YouTube. (n.d.). Youtube fact sheet. Retrieved October 30, 2007, from http://www. youtube.com/t/fact_sheet

Zeff, R. (2007). University design across the curriculum. In. T. S. Glickman & S. C. White (Eds.), *Managing for innovation*. New Directions for Higher Education (pp. 27-44). San Francisco: Jossey-Bass.

APPENDIX A

Paper-based Solicitation Letter to Chief Student Affairs Officers

Date

Dear Chief Student Affairs Officer:

I am requesting your assistance in soliciting participants for dissertation research entitled "Information Technology Processes Used Among College Student Affairs Professionals." The National Association of Student Personnel Administrators (NASPA) approved this research and your Institution was randomly selected. I strive to reach out information technology leaders working within, or working with, college student affairs departments. The participation would require these professionals to fill out a questionnaire accessible by an Internet link (included in this packet). Upon completion of the questionnaire, participants have the option to fill out an entry form for an opportunity to receive a $50 Amazon gift certificate.

Directions:
This packet includes two letters. I request that both are distributed to potential participants that fit into the category of information technology leader within, or working with, college student affairs. The deadline for participation is **Sunday, February 17, 2008**.

Thank you for your participation. If you have any questions or concerns, contact information is provided below.

Sincerely,

Gail A. Cole-Avent

This research is conducted by Gail A. Cole-Avent, a doctoral candidate, from the Department of Counseling and Human Development Services at the University of Georgia (telephone number, email address) under the direction of Dr. Diane L. Cooper, Department of Counseling and Human Development Services, University of Georgia (telephone number, email address).

http://vpsa4.vpsa.uga.edu/surveys/technologystudentaffairs/technologystudentaffairs.htm

APPENDIX B

Paper-based Solicitation Letter to Information Technology Leaders

Date

Dear Information Technology Leader:

I am requesting your participation in dissertation research entitled "Information Technology Processes Used Among College Student Affairs Professionals." The National Association of Student Personnel Administrators (NASPA) approved this research and your Institution was randomly selected. The intent of this research is to learn about the current state of information technology use in college student affairs from the information technology leaders' point of view. I strive to reach out information technology leaders working within, or working with, college student affairs departments. The participation would require you to fill out a questionnaire easily accessible by this Internet link:

http://vpsa4.vpsa.uga.edu/surveys/technologystudentaffairs/technologystudentaffairs.htm

Upon completion of the questionnaire, you have the option to fill out an entry form for an opportunity to receive a $50 Amazon gift certificate. The deadline for participation is **Sunday, February 17, 2008**.

Thank you for your participation. If you have any questions or concerns, contact information is provided below.

Sincerely,

Gail A. Cole-Avent

This research is conducted by Gail A. Cole-Avent, a doctoral candidate, from the Department of Counseling and Human Development Services at the University of Georgia (telephone number, email address) under the direction of Dr. Diane L. Cooper, Department of Counseling and Human Development Services, University of Georgia (telephone number, email address).

APPENDIX C

Solicitation Electronic Mail Message to NASPA Technology Knowledge Community

Dear NASPA Technology Knowledge Community Members,

I am requesting your assistance in participating in, or soliciting participants for, dissertation research entitled "Information Technology Processes Used Among College Student Affairs Professionals." I strive to reach out ***information technology leaders*** working within, or working with, college student affairs departments. The participation would require these professionals to fill out a questionnaire easily accessible by an Internet link. Upon completion of the questionnaire, participants have the option to fill out an entry form for an opportunity to receive a $50 Amazon gift certificate.

Directions:
Please forward this email to potential participants that fit into the category of information technology leader within, or working with, college student affairs. The deadline for participation is **Sunday, February 17, 2008**. The link to the questionnaire is provided below.

http://vpsa4.vpsa.uga.edu/surveys/technologystudentaffairs/technologystudentaffairs.htm

Thank you for your participation. If you have any questions or concerns, contact information is provided below.

Sincerely,
Gail A. Cole-Avent

This research is conducted by Gail A. Cole-Avent, a doctoral candidate, from the Department of Counseling and Human Development Services at the University of Georgia (telephone number, email address) under the direction of Dr. Diane L. Cooper, Department of Counseling and Human Development Services, University of Georgia (telephone number, email address).

APPENDIX D

Solicitation Electronic Mail Message to ACUHO-I Members

Dear ACUHO-I Members,

I am requesting your assistance in soliciting participants for dissertation research entitled "Information Technology Processes Used Among College Student Affairs Professionals." I strive to reach out ***information technology leaders*** working within, or working with, college student affairs departments. The participation would require these professionals to fill out a questionnaire easily accessible by an Internet link. Upon completion of the questionnaire, participants have the option to fill out an entry form for an opportunity to receive a $50 Amazon gift certificate.

Directions:
Please forward this email to potential participants that fit into the category of information technology leader within, or working with, college student affairs. The deadline for participation is **Sunday, February 17, 2008**. The link to the questionnaire is provided below.

http://vpsa4.vpsa.uga.edu/surveys/technologystudentaffairs/technologystudentaffairs.htm

Thank you for your participation. If you have any questions or concerns, contact information is provided below.

Sincerely,
Gail A. Cole-Avent

This research is conducted by Gail A. Cole-Avent, a doctoral candidate, from the Department of Counseling and Human Development Services at the University of Georgia (telephone number, email address) under the direction of Dr. Diane L. Cooper, Department of Counseling and Human Development Services, University of Georgia (telephone number, email address).

APPENDIX E

Internet-based Consent Form

A dissertation research study is being conducted on information technology leader's perception of the current state of technology use in college student affairs. This research, entitled "Information Technology Processes Used Among College Student Affairs Professionals," is conducted by Gail Cole-Avent, a doctoral candidate, from the Department of Counseling and Human Development Services at the University of Georgia (telephone number, email address) under the direction of Dr. Diane L. Cooper, Department of Counseling and Human Development Services, University of Georgia (telephone number, email address).

The purpose for this research is to learn about the current state of technology use in college student affairs from the information technology leaders' point of view. If I volunteer to take part in this study, I will be asked to answer an Internet-based questionnaire which was developed to measure my behavior, attitude and knowledge regarding the following topics: information technology support, technology skills and fluency, skill standards, and future educational opportunities.

The benefits are that I am contributing my expertise to the information technology advancement of the college student affairs profession and development of its professionals. The researcher also hopes that the results from the findings will help in the creation of functional processes that support the ability for professionals to establish fluency with information technology and learn how to successful integrate it into practice.

I understand that my participation is voluntary. No foreseeable risks are expected. I can refuse to participate or stop taking part without giving any reason, and without penalty. This Internet-based questionnaire will not ask for any individually-identifiable information about me; however, I understand that there is a limit to the confidentiality that can be guaranteed due to the technology itself. If I include any personal information, the researcher will remove it for confidentiality purposes. All electronic responses will be kept in a secure location. The results of participation will be confidential.

If I am interested in participating in the research, but do not want to complete the questionnaire on the Internet, I may request a paper copy or an attached electronic version be sent to me. If I choose to participate through the Internet-based questionnaire, I will be expected to read and indicate my agreement with the consent form. The questionnaire will take approximately 20 minutes to complete. If I choose not to respond to a question, I have the option to indicate that by selecting "I choose not to respond" and move on to the next question. Once finished with the

questionnaire, I have the final choice to submit my responses to be included in the research, or discard them.

I will affirm my understanding and agreement to the terms of this consent form by entering the password "technology"[word in red] in the password box at the end of this page. I will be provided access to the questionnaire once I consent to participate in this study. I may print out this page as a receipt of assigned consent for my records prior to entering the password.

At the end of the questionnaire, I will be given the option to enter my name into a selection for the single prize of a $50 Amazon gift certificate.

The investigator will answer any further questions about the research, now or during the course of the project. Her contact information is listed below.

Gail A. Cole-Avent
Email address
Telephone number

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

APPENDIX F

INFORMATION TECHNOLOGY PROCESSES USED AMONG COLLEGE STUDENT AFFAIRS PROFESSIONALS

This purpose of this questionnaire is to solicit responses from information technology leaders within, or working with, a division of college student affairs. The goal of this study is to learn about the current state of technology use in college student affairs from *the information technology leaders' point of view*. In an effort to contribute to the transition of college student affairs into an information technology fluent profession, your responses will help in the development of functional processes that address the growing need to establish expertise and the ability to integrate information technology into practice.

The questionnaire has been developed to measure your behavior, attitude and knowledge in working with college student affairs professionals. Open-ended questions are included to solicit further descriptive feedback.

For the purpose of this research, a college student affairs division includes functional units that fall within the organization chart at your institution that may include, but is not limited to, the Vice President or Chancellor of Student Affairs' office, Campus Life, Dean of Students, Dining Services, Fraternity and Sorority Life, Judicial Affairs, Leadership, Multicultural Services, Orientation, Recreational Sports, Residence Life/Housing, Student Activities, and the Women's Center.

The instrument should take approximately 20 minutes to complete. Select the answer that best represents your response. You must select one answer for each question the page in order to move on to the next page.

Section 1: Demographic Information

► Indicate your age.

☐1 18, 19, 20, 21….76 and older

► Indicate your gender.

☐1 Male
☐2 Female
☐3 Transgender
☐8 I choose not to respond

► Indicate your highest academic degree attained.

☐1 High School Diploma
☐2 Associate's Degree
☐3 Bachelor's Degree
☐4 Master's Degree
☐5 Doctoral Degree
☐6 Other
☐8 I choose not to respond

► Indicate the category that best describes your current employment.

- ☐1 Work within a college student affairs division office
- ☐2 Work within a college student affairs department office
- ☐3 Work within an institution's central technology administrative department
- ☐4 Independent Contract
- ☐5 Other: Please specify _____

► Indicate how long you have worked in information technology within higher education.

- ☐1 1, 2, 3…20 years or more

► Indicate the category that best describes your work history.

- ☐1 Hired directly into a college student affairs department.
- ☐2 Transitioned from Information Technology department to College Student Affairs department.
- ☐3 Transitioned from College Student Affairs department to Information Technology department

► Indicate the institutional student population where you work.

- ☐1 0 – 999
- ☐2 1,000 – 2,999
- ☐3 3,000 – 9,999
- ☐4 10,000 – above

► For how many college student affairs professionals do you provide information technology support?

- ☐1 0, 1, 2, 3…30 or more

► Indicate the category that best describes your primary role in working with college student affairs division or departments.

- ☐1 Develop ideas to create technological tools for division or department.
- ☐2 Design, construct, test a technological tool for division or department.
- ☐3 Adjust or add to existing technological tool for divisional or departmental use.
- ☐4 Deliver, install, operate, maintain or repair technological tools for division or department.
- ☐5 Other

As you answer the remaining questions, please provide a response that reflects the majority of college student professionals with whom you work.

Section 2: Support

To gather information about the different ways you provide support to college student affairs professionals, please select that which best describes your response to the following statements.

I provide the following support to student affairs professionals:	**No** 1	**Yes** 2
Information technology technical support (troubleshooting)	1	2
Information technology educational support (introduce new tools, talk about popular uses)	1	2
Technology training support (teach how to use existing technology)	1	2

What percentage of your time did you spending doing the following in the past month?	**Never (0%)** 1	**Rarely (25%)** 2	**Occasionally (50%)** 3	**Often (75%)** 4	**Always (100%)** 5
Information technology technical support (troubleshooting)	1	2	3	4	5
Information technology educational support (introduce new tools, talk about popular uses)	1	2	3	4	5
Technology training support (teach how to use existing technology)	1	2	3	4	5

Within the last month, I provided support to college student affairs professionals for the following technology issues:	Never 1	Rarely 2	Occasionally 3	Often 4	Always 5
Set Up Personal Computer	1	2	3	4	5
Connect Computer to Network	1	2	3	4	5
Use Computer to Communicate with Others	1	2	3	4	5
Use Word Processor Applications	1	2	3	4	5
Basic Operating System Features	1	2	3	4	5
Database System to Develop, Access, or Manage Information	1	2	3	4	5
Internet to Find Information and Resources	1	2	3	4	5
Standard Spreadsheet Application	1	2	3	4	5
Web Page Design	1	2	3	4	5
Electronic Mail	1	2	3	4	5
Calendar Program	1	2	3	4	5
Developing Internet-Based Services	1	2	3	4	5
Scanner	1	2	3	4	5
Presentation Applications (e.g., Microsoft PowerPoint)	1	2	3	4	5
Technology for Assessment Needs	1	2	3	4	5
Graphics, Artwork, Digital Imaging	1	2	3	4	5
Blogs (web-based journal)	1	2	3	4	5
Podcasts (digital audio)	1	2	3	4	5
Social Networking (e.g., Facebook and MySpace)	1	2	3	4	5

► Please list any other types of support you provide, which were not listed. *(Optional)*

Section 3: Information Technology Fluency

The next group of questions will address the concept of information technology fluency. *Information technology fluency* is defined as the lifelong learning process that involves applying existing knowledge in an effort to adapt to the change. It focuses on continually acquiring knowledge for the effective implementation of information technology in the present and future (NRC, 1999).

Respond to the following statements based on your experience with college student affairs professionals.

College student affairs professionals:	**Strongly Disagree** 1	**Disagree** 2	**Neither Agree or Disagree** 3	**Agree** 4	**Strongly Agree** 5
Engage in lifelong learning process about information technology	1	2	3	4	5
Apply existing knowledge to adapt to the information technology changes	1	2	3	4	5
Continually acquire knowledge about information technology in order to effectively implement it.	1	2	3	4	5

► What resources are available on your campus to help college student affairs professionals become fluent? *(Optional)*

► In what ways, if any, have you observed the fluency of college student affairs professionals? *(Optional)*

► Indicate the category that best describes the primary technology decision-making process in your division or department.

Decisions are made:

- ☐ 1 By an individual independent of others in the department/division
- ☐ 2 Collectively by departmental/divisional members
- ☐ 3 By departmental leadership or technology leaders
- ☐ 4 After another technology decision was made
- ☐ 5 I do not know

College student affairs professionals are able to:	Only with full assistance 1	With majority assistance 2	With some assistance 3	With very little assistance 4	No assistance needed at all 5
Define and clarify a technology problem and use a variety of technological resources to implement a solution.	1	2	3	4	5
Use information technology to effectively communicate with target audience.	1	2	3	4	5
Determine if a proposed technology will meet their need.	1	2	3	4	5
Find, evaluate, and design information technology for intended use	1	2	3	4	5
Collaborate remotely or asynchronously with others through information technology tools.	1	2	3	4	5
Learn a new technology and efficiently adapt to it.	1	2	3	4	5
Think about information technology's influence on policy issues	1	2	3	4	5

Section 4: Information Technology Skills

► Indicate the category that best describes the majority of college student affairs professionals with whom you work?

College student affairs professionals at my institution:

- ☐ 1 Are suspicious, resistant toward technology and those who promote it, technology must be failsafe before considering it.
- ☐ 2 Wait for critical mass to favorably critique the technology.
- ☐ 3 Are deliberate and fully understand the influence of a given technology before adopting it.
- ☐ 4 Adopt technology early, serve as role model to those contemplating adoption, and influence the critical mass.
- ☐ 5 Venturesome with innovation and have the capacity to understand and apply complex technical concepts.
- ☐ 6 I do not know.

College student affairs professionals at my institution are able to perform the following tasks:	**Only with full assistance** **1**	**With majority assistance** **2**	**With some assistance** **3**	**With very little assistance** **4**	**No assistance needed at all** **5**
Set Up Personal Computer	1	2	3	4	5
Connect Computer to Network	1	2	3	4	5
Use Computer to Communicate with Others	1	2	3	4	5
Use Word Processor Applications	1	2	3	4	5
Basic Operating System Features	1	2	3	4	5
Database System to Develop, Access, or Manage Information	1	2	3	4	5
Internet to Find Information and Resources	1	2	3	4	5
Standard Spreadsheet Application	1	2	3	4	5
Web Page Design	1	2	3	4	5
Electronic Mail	1	2	3	4	5
Calendar Program	1	2	3	4	5
Developing Internet-Based Services	1	2	3	4	5
Scanner	1	2	3	4	5
Presentation Applications (e.g., Microsoft PowerPoint)	1	2	3	4	5
Technology for Assessment Needs	1	2	3	4	5
Graphics, Artwork, Digital Imaging	1	2	3	4	5
Blogs (web-based journal)	1	2	3	4	5
Podcasts (digital audio)	1	2	3	4	5
Social Networking (e.g., Facebook and MySpace)	1	2	3	4	5

►What technology skills are needed for student affairs professionals to be successful in their current jobs? *(Optional)*

►What technology skills are needed for student affairs to be successful in the future? *(Optional)*

Section 5: Skill Standards

Skill standards "define the professional job-related knowledge, skills, and abilities required to succeed in the digital-age workplace. They can be used as a foundation tool for developing educational curriculum, profiling jobs, recruiting and evaluating employees, and designing academic and professional certification" (Evans, 2002, 25).

► Do you believe that technology skill standards should be considered for the college student affairs profession?

- ☐1 No
- ☐2 Yes
- ☐3 I don't know

► Do you believe that college student affairs profession would benefit from technology skill standards?

- ☐1 No
- ☐2 Yes
- ☐3 I don't know

I believe:	**Strongly Disagree** 1	**Disagree** 2	**Neither Agree or Disagree** 3	**Agree** 4	**Strongly Agree** 5
Separate skill standards are needed for varying student affairs functional areas (e.g., campus activities, judicial affairs, housing, career)	1	2	3	4	5
Separate skill standards are needed for varying experience levels of student affairs professionals (e.g., entry-level, mid-level, senior-level)	1	2	3	4	5

► What technology skill standards should be considered for the student affairs profession? *(Optional)*

Student affairs information technology skill standards should include:	**Strongly Disagree** 1	**Disagree** 2	**Neither Agree or Disagree** 3	**Agree** 4	**Strongly Agree** 5
Performance indicators to determine if a task is performed well.	1	2	3	4	5
Technical knowledge that focus on skills, abilities, and tools.	1	2	3	4	5
Employability skills that focus on competencies associated with a functional area	1	2	3	4	5
Tasks that support future use of technical knowledge.	1	2	3	4	5

Section 6: Educational Opportunities

The following types of technology-focused educational opportunities would benefit the college student affairs professionals with whom I work:	**Strongly Disagree** 1	**Disagree** 2	**Neither Agree or Disagree** 3	**Agree** 4	**Strongly Agree** 5
Discovery learning though own experimentation	1	2	3	4	5
Active learning through tutoring programs	1	2	3	4	5
Graduate preparation programs	1	2	3	4	5
Full day training	1	2	3	4	5
Bag-lunch sessions	1	2	3	4	5
Books or other literature	1	2	3	4	5

► Indicate the category that best describes your belief on who should bear the primary responsibility of educating college student affairs professionals to work with information technology.

- ☐ 1 College student affairs professionals
- ☐ 2 Information technology leaders directly working with student affairs
- ☐ 3 Institutional information technology leaders
- ☐ 4 Supervisor
- ☐ 5 Professional organization
- ☐ 6 Graduate program
- ☐ 7 I do not know

►What should be incorporated in these educational opportunities? *(Optional)*

Thank you for completing this questionnaire and sharing your thoughts regarding the topic of information technology within college student affairs. Upon completion of the questionnaire, you have the option to fill out an entry form for an opportunity to be awarded the single award of a $50 Amazon gift certificate.