A PHENOMENOLOGICAL STUDY OF INFORMATION TECHNOLOGY (IT) PROFESSIONALS IN HIGHER EDUCATION

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For Lacey, Jillian, Lucas, and Alyssa.

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ABSTRACT

A PHENOMENOLOGICAL STUDY OF INFORMATION TECHNOLOGY (IT) PROFESSIONALS IN HIGHER EDUCATION

by Jerald W. Todd

It is the job of IT professionals to design, implement, and support the critical technologies that all university stakeholders rely upon. A group of people that are absolutely critical to the success of the organization, but one that is often misunderstood, underutilized, and underappreciated. As institutions of higher education continue into the digital age and continue to become increasingly dependent upon technology, it is crucial to better understand those who are charged with the implementation, maintenance, and support of the technologies that allow stakeholders to be successful. The purpose of this phenomenological study was to explore the essence of being an IT professional working in higher education. The focus of this study was to gain an understanding of the technical, motivational and cultural needs of IT professionals working in higher education. Data for this study were collected using in-depth, one-on-one, semi-structured interviews with seven participants from six different four-year degree-granting institutions in the state of Michigan. A total of 39 codes were discovered from the data analysis, in which five themes emerged. The first theme, It's Who I Am: The Ascribed Importance of Identifying as an IT Professional, participants shared about their hobbies, motivation, strengths, weaknesses, and the ways in which they communicate. The second theme was That's Not Me: Being Stereotyped as an IT Professional, where participants shared their thoughts and perceptions about being stereotyped, and the external perceptions others have of IT professionals and the field of information technology. The third theme was It's What I Do: The Impact of the Work Performed by IT Professionals, in which participants shared about the work they perform,

and the impacts that work have on the various institutional stakeholders. Theme four was My Work Environment: The Structure and Culture of the IT Professionals' Work Environment, where participants shared about the work environment and the culture of both the institution and the department in which they work. Theme five was Choosing Higher Education IT: The Benefits and Drawbacks to Working in Higher Education as an IT Professional, where participants shared the benefits of working in both information technology, as well as in higher education.

TABLE OF CONTENTS

LIST OF TABLES

TABLE PAGE

CHAPTER I

INTRODUCTION

Technology continues to play a crucial role in many aspects of higher education. From financial and student information systems to financial aid systems, university administrators rely on technology for business-critical operations. Customer relation management systems, email distribution lists, business intelligence dashboards, and web-based admission systems are some of the technologies that underlie student recruitment efforts for universities. Inside the classroom, instructors rely on technology to present information and facilitate discussion. Technologies such as student response systems, often referred to as "clickers," are used for eliciting real-time feedback from students (DeBourgh, 2007) and enhancing classroom participation. Students utilize campus infrastructure to wirelessly connect to resources from multiple mobile devices as they roam the campus. The evolution of non-traditional classrooms continues to be seen across college campuses as well. Distance education and online instruction have become significant components of educational systems around the world (Thomason, 2009). As evidence of this, more than 6 million students took at least one online class in 2015 (Schaffhauser, 2017).

Information technology departments at institutions of higher education are asked to do increasingly more and, as a result, are facing a wide variety of challenges (Johnston & Wierschem, 2007). IT professionals must stay atop of the changing technological needs of all areas of the institution. The way in which faculty and students communicate is one example of this. Technology impacts both the form and timing of communication for faculty and students, including written correspondence, audio and video conferencing, and computer-mediated conferencing (Steiner, 2001). Developing and maintaining systems to host and conduct both synchronous and asynchronous learning activities require a significant amount of IT support. The

success of an organization, including colleges and universities is predicated on having skilled IT professionals in the workforce (Kenan-smalls, 2011). However, little is known about this group of people and their lived experiences working in higher education.

The following chapter includes an examination of IT professionals, both in general terms and specific to higher education. A statement of problem will be provided, along with the purpose for this study. The research question guiding this study will be given, and the significance of this study will be discussed. Limitations, delimitations, and assumptions will be given, and will c3onclude with an overview of the complete document.

IT Professionals

The field in which IT professionals fall is quite broad, including positions such as, but not limited to, web design and development; telecommunications and networking; systems administration; software development; and applications administration. Each require a different set of skills and knowledge acquired through a variety of methods, including formal education, self-education, and on-the-job training**.** Evaluating April 2016 job openings in the state of Michigan through the Dice.com website highlights some of the typical requirements of these positions. Nearly all the identified postings require a bachelor's degree in computer science or related field, with some stating that an advanced degree is preferred. Some, however, state that relative experience may substitute for the degree requirement on a year-for-year basis. Most postings also required a minimum number of years of experience in the area of the position, ranging from three to ten years. For each position type, specific skills and knowledge were also listed as requirements. For example, a current web developer posting requires applicants to have demonstrated successful experience in one or more web software development platforms, tools, and database management systems including Microsoft .NET, C#, and SQL Server. A posting

for a network and telecom architect, on the other hand, requires applicants to possess proven expert experience with network capacity planning, network security principles, and general network management best practices, as well as proven success with LAN, WAN, and WLAN design and implementation.

Similar skills and requirements can be found in postings specific to higher educational institutions in Michigan as found on higheredjobs.com for the same time period. Along with the skills previously mentioned, additional requirements can often be found that are unique to the educational environment, such as knowledge of the Family Educational Rights and Privacy Act (FERPA), learning management systems, and student information systems. While each organization will have different needs, the skills and knowledge required for each type of position are often quite similar.

While current job postings can provide an overview of the technical skills and knowledge a typical IT professional might possess, it does not allow for an understanding of the people themselves or their lived experiences. This is especially true of those IT professionals who work in higher education. IT professionals who choose to work in higher education share common lived experiences, including the way they engage with faculty, staff, students, peers, leaders, and other tech-related constituencies, though little is understood of those experiences.

Statement of Problem

As college and university leaders continue to leverage technology to fulfill business and academic goals, the need for skilled Information Technology (IT) professionals to effectively manage and integrate technology becomes essential (Holmes, 2006). As the number and complexity of new technologies increase across the campus, so do the responsibilities and challenges of the IT professionals tasked with their operation and support. On current college

campuses, the average number of unique devices per student is now up to seven (Hudson, 2016). This alone can have huge implications on the network infrastructure and the IT professionals responsible for maintaining the network and supporting this massive number of devices, a far cry from the overhead of maintaining a few campus computer labs just a few decades ago. The use of these devices and the myriad other technologies utilized by students, faculty, and staff do not cease at the end of the typical business day. Many, if not most, applications and support systems are used and expected to be available outside of traditional business hours. Students expect to be able to search and register for classes anytime, while simultaneously accessing their current course content and collaborating with peers through the institution's learning management system. Door access systems are expected to work throughout the night, allowing students to swipe in and out of residence halls and dorm rooms. Point of sale systems are used at evening and weekend events to support the sale of goods and services for athletics events, concerts, and other campus activities. Students, faculty, and even community members utilize the campus library in the evenings, requiring library management systems to be available to check out books and other resources, with digital repositories accessed 24 hours from all around the globe. Faculty depend on technology to facilitate courses, both online and inside of traditional classrooms. Faculty also depend on the high-computing research clusters to carry out complicated research simulations. They depend on technology to collaborate with colleagues inside and outside of their institution, and to assist and mentor students from around the globe. Administrators depend on technology to keep the institution operating efficiently and effectively. These increased and complex demands are happening at a time where state appropriations are dwindling, and the need to ensure students have access to higher education is increasing. The current higher education landscape asks everyone to do more with less.

The increasing use of technology in all facets of the institution has led to increased responsibilities and stress for IT professionals. To ensure the availability of these systems, IT departments aim to limit the amount of time any system is unavailable, and often use “five 9s” as the target. This means that a system is available 99.999 percent of the time, which equates to just 5.39 minutes of down time in a given year. With limited resources, this number is often unrealistic, and often times three or four “nines” is the goal of the organization (8.76 hours and 53 minutes of down time, respectively). When updates and patches need to be applied and cannot be done without down time, IT departments in higher education attempt to do so at the times least intrusive to students, faculty, and staff, which often leads to work being done in the middle of the night, on weekends, or even on holidays.

Another aspect that has added additional burden to IT professionals and is often overlooked or not considered by many stakeholders is security. As stated by Fischer (2017), higher education will “continue to be targeted because it has large volumes of public address space, high bandwidth, and valuable information combined with an often-weak security posture (p.1).” According the Internet Security Threat Report published by Symantec in 2015, ten percent of all 2014 security breaches involved the education sector.

The combined pressure and stress of all these areas of responsibility can be overwhelming for IT professionals and can lead to long hours and frustration. Across the IT industry as a whole, IT professionals average over 52 hours of work per week (Tsai, 2015). When considering the multitude of academic and business systems and devices utilized by institutional stakeholders and the support and maintenance that encompass them, the additional hours, as well as the stress are understandable. With higher education offering historically lower salaries compared to other industries (Holmes, 2006), asking IT staff to do more with less, and

the allure of better wages and positions coming from the constant bombardment of social media advertising, it is no wonder that colleges and universities are struggling to retain IT staff. With the education and health industries having the fourth most expensive replacement costs for employees at nearly $14,000 per employee (O'Connell & Kung, 2007), the loss of IT staff can have additional negative impacts beyond that of technological support.

A stable IT workforce is crucial for contemporary higher education institutions (Holmes, 2006). While ample research exists on the importance of technology in higher education and having skilled IT professionals to maintain critical resources, little is known about the IT professionals themselves. The information discovered through a qualitative study might hold valuable insight into the motivational factors that influence IT professionals to pursue and continue employment in higher education. The importance of technology in the mission of higher education has become quite clear, yet researchers have been remiss in studying those responsible for its design, implementation, and support. This study intends to address this existing gap in literature.

Purpose Statement

The purpose of this phenomenological study was to explore the essence of being an IT professional working in higher education. The focus of this study was to gain an understanding of the technical, motivational, and cultural needs of IT professionals working in higher education. Illuminating the lived experiences of IT professionals can assist educational leaders across multiple domains of the organization: human resource personnel can gain a better understanding of the needs and skills of this group of employees; and IT managers and supervisors can influence the culture of the work place to better align with the needs of IT professionals, allowing them to be successful and satisfied in their duties; academic leaders can

use this insight when developing strategic plans to ensure the technology that faculty, students, and staff depend upon is adequately cared for and that those same constituencies are fully supported in their many uses of these technologies.

Examining the lived experiences of IT professionals working in higher education will allow educational leaders to better understand the needs of IT professionals, how best to interact and motivate them, and develop or modify proper recruitment and retention strategies to hire and retain this highly skilled group of employees and help ensure organizational goals can be accomplished.

Research Question

Research question for this phenomenological study was: What is the essence of being an IT professional working in higher education?

Significance of Study

While significant literature exists on the impact of technology on education, little is known about the IT professionals who maintain the technology for institutions. The significance of this study will be to help fill the gaps in literature on this area of higher education institutions. In doing so, a few implications might arise from this study. The first is around the recruitment and retention of employees in IT organizations within universities. Like any organization, having the right people in place to support operations is essential to the success of the institution. Knowing more about the factors that lead IT professions to choose to work in education can help university hiring managers and human resource departments recruit exceptional candidates.

Once hired, or for existing employees, understanding more about this group of IT professionals might help with retention strategies. Proactive offerings of professional development to information systems workers can increase employee loyalty and decrease

employee dissatisfaction, absenteeism, and turnover (Mak & Sockel, 2001). By better understanding IT professionals, more appropriate professional development opportunities can be created to allow for personal and organizational growth, and help to retain valuable employees. Leaders can also influence organizational culture to better align with the needs and values of IT professionals in this type of environment.

The second implication might be for the improved support for faculty and students in regard to university technology. By better understanding the IT professionals who control and maintain the entire campus technology infrastructure, the organization can ensure the individuals' goals and expectations align with departmental and organizational goals. For example, understanding how the lived experiences of an IT employee shapes his or her role in areas such as student success or faculty pedagogical support will allow the department to place individuals in roles in which they are best suited to provide the best possible support to faculty and students.

The third implication might be for the improved efficiency of university operations. As university administrators are continued to be pressured by students, parents, and state and federal government to ensure the costs of higher education are affordable (Lahey & Griffith, 2002), better understanding the lived experiences, motivation, and culture of IT professionals can help increase operational effectiveness of the university, keeping costs low, and resources properly utilized.

Another implication might be that faculty and administrators begin to view IT professional as partners in learning and organizational operation. IT professionals or the duties in which they perform are often not considered until something breaks or goes wrong. Changing the

perspective of faculty and staff might allow for increased understanding of IT professionals and better collaboration in designing and implementing new systems and services.

Definition of Terms

C#: A program language based on modern object-oriented design methodology (Robinson, 2004).

FERPA: The Family Educational Rights and Privacy Act (FERPA) guides policies and procedures regarding the privacy of students' educational records.

LAN: This is an acronym for Local Area Network. A LAN covers a small local area of computers, storage, printers, and other various network nodes (Dean, 2012).

Microsoft .NET: Microsoft .NET is a platform created by Microsoft for developing Windows applications, web applications, and web services.

SQL Server: An enterprise-class database relational database management server designed by Microsoft (Chapple, 2009).

Information Technology Department (IT): Manages the technology, systems, and computer infrastructure for an organization, including user and desktop support, network management, business and financial applications, and strategic technology planning for the organization (Dumont, 2011).

Information Technology Professional (IT professional): As used herein, refers to individuals holding positions within an organization's Information Technology Department.

Technology: The hardware, software, networks, and general infrastructure utilized in the collection and dissemination of information and communication, and in the organization of human activities (Dumont, 2011).

WAN: This is an acronym for Wide Area Network. A WAN is a broad network which covers a larger geographic location, such as two corporate offices interconnected over a geographical distance (Dean, 2005).

Study Assumptions

The largest assumption for this study is that there are strong similarities in the lived experiences of IT professionals across multiple institutions of higher education. It is also assumed that similar experiences are shared among IT professionals regardless of the role in which they play for an organization's information technology department. Another assumption of this study is that participants will respond to the interview questions openly and honestly. The responses of each participant, as well as the manner in which they respond, enable phenomenological researchers to identify patterns of meaning, which is necessary for the accuracy and completeness of the research data (Moustakas, 1994). Finally, an assumption is made that the findings from this study will assist in the development or modification of policies and procedures to increase the potential to retain highly skilled IT professionals, or to assist in influencing the culture in such a way as to better accommodate the needs of IT professionals, and in turn, all university stakeholders.

Limitations and Delimitations

This study was limited to IT professionals who have worked for a college or university in the state of Michigan for at least the past two years in a full-time capacity. Fewer than two years at an institution may not be enough time to sufficiently understand the workings and culture of the institution and department. This study was also limited to IT professionals who are directly responsible for the installation, maintenance, or development of hardware or software necessary to the core infrastructure in which critical business functions rely. Examples of these would be,

but are not limited to, an institution's Learning Management System (LMS), Student Information System (SIS), and Financial Information Systems (FIS), as well as those working in networking, software development, security, and business intelligence areas. This study does not include those who work in service desk-related roles, nor does it include student workers. This study was also limited to those employed directly by the institution, and not hired through an external entity to provide services on behalf of the institution.

Overview of Methodology

This study is qualitative in nature, as it seeks to understand the experiences of IT professionals in higher education as shared by the people in this group, and the meaning in which these people attribute to those experiences. Phenomenological research examines the feelings, biases, and attitudes and seeks to uncover commonalities among participants' experiences and perceptions (Simon, 2006). As the purpose of this research was to discover the essence of what it means to be an IT professional in higher education, a group on which little literature exists, this was an appropriate approach to utilize for this study. The research was collected through in-depth, one-on-one interviews with willing participants who fit the description of the study. These interviews were semi-structured, and used open-ended questions to allow the experiences to be shared. Interviews were conducted face-to-face with participants and took place at a location of their choosing. Video conferencing tools were utilized for participants located at a distance and who agreed to using such technologies in place of in-person interviews. Along with the semi-structured interviews, employee job descriptions and organizational mission statements were also collected and analyzed to help validate and strengthen the understanding of the lived experiences of the participants. Criterion sampling, along with snowball sampling were utilized to solicit participants. The sample consisted of IT professionals who have worked for a college or

university in Michigan for at least the past two years in a full-time capacity and who were in a role that is directly responsible for the installation, maintenance, or development of hardware or software necessary to the core infrastructure in which critical business functions of the institution rely. This qualitative study utilized Moustakas' (1994) suggested methods for analyzing data in phenomenological research, which include the analysis of significant statements, the generation of meaning units, and the development of an essence description as well as Glaser's (1965) constant comparative method for use during the coding process.

Study Overview

Chapter I began with an introduction to the study and an overview of IT professionals. It was followed by the statement of problem, along with the purpose for the study. The research question guiding this study was provided, and the significance of this study was discussed. The chapter then covered the limitations, delimitations, and assumptions of this study. In Chapter II a literature review covering educational technology, IT employee motivation, and IT culture, in regards to how they encompass an IT professional's lived experience working in higher education will be provided. Chapter III will explain the methodology governing how these data will be collected and analyzed. Chapter IV will present the findings of this study, while Chapter V concludes with a discussion of the findings, as well as recommendations for future research.

CHAPTER II

LITERATURE REVIEW

The purpose of this phenomenological study was to explore the essence of being an IT professional working in higher education. The focus of this study was to gain an understanding of the technical and cultural needs of IT professionals working in higher education. Before examining this phenomenon, existing literature needs to be reviewed. Therefore, the purpose of this chapter is to provide an overview around information technology in higher education, information technology employee motivation, and information technology culture.

Information Technology in Higher Education

Beyond devices such as the abacus, technology has been used for educational purposes since the early twentieth century. Duplication machines such as the mimeograph were used to produce copies of documents for classroom distribution (Dunn, 2011). Slide projectors became a popular tool for instructors during the 1950's as a visual learning aid for students (Dunn, 2011). This evolved into the use of television and broadcasting. An excellent example of this use of technology for educational purposes is the broadcast television show *Mr. Rogers' Neighborhood*. Fred Rogers created and hosted this half-hour children's television show for PBS for over three decades, running from the late 1960's until the early 2000's, devoted to his beliefs that "television can educate children through a mix of simple but profound storytelling and the encouragement of imagination" (Bishop, 2003, p. 16). The first programmable computer in the United States, the MARK I, was designed by a Harvard graduate student, Howard H. Aiken, to solve advanced mathematical physics problems encountered in his research ("The Mark I at Harvard," n.d.). IBM, a company specializing in punch card systems, was persuaded to develop the MARK I over a five-year period, with its completion coinciding with the start of World War

II. When it was delivered to Harvard, operation was overseen by the U.S. Navy Bureau of Ships for military purposes, helping to solve extremely difficult mathematical problems ("The Mark I at Harvard," n.d.). After the war, early use of the MARK I focused primarily around mathematics and engineering as a mathematical problem solving tool. In the late 1950s, Dartmouth College began experimenting with allowing bright undergraduate students to program on their very small LGP-30 computer and found that they were extremely adept at computer programming with little training (Kemeny & Kurtz, 1968). Shortly after this, John Kemeny and Thomas Kurtz of Dartmouth had an idea to use the concept of time-sharing, which at the time meant the ability to provide simultaneous service to many users through the use of typewriter-like terminals, to provide students an alternative to standing in long lines with punch cards for batch processing, effectively shifting the role of computers in education from a strictly research activity to an academic one (Molnar, 1997). Over the next few decades, the use of computers in education would continue to increase, especially with the introduction of microcomputers in the mid-1970s. As computers and other technology use increased, so did the need for a group of people to program, support, and maintain the hardware and software, effectively creating the role of the IT professional in higher education. While these early technologies helped to pave the way for future classroom innovations, it was the proliferation of the Internet and the advent of the World Wide Web in the early 1990s that ushered in a new age of educational technology and helped form the many different duties assigned to IT professionals in higher education today.

Internet

Ryan (2010) defined the Internet as a loose arrangement of connected but autonomous networks of devices, where each device uses a protocol to communicate with other devices on the network. The development of what is now the Internet began with the creation of the

Advanced Projects Research Agency (ARPA) by President Eisenhower after the Soviet Union launched its first satellite, Sputnik, in 1957 (Jackson, 2001). ARPA funded a series of academic research projects on networking computers, looking for a way to send information between computers in an efficient and robust way that would be able to withstand an attack on the physical infrastructure, which was a vulnerability with the then current telephone network with its centralized switches (Gillies & Cailliau, 2000). These projects led to an early computer network called ARPANET, which later became the Internet when the military split off to form MILNET in the early 1980s (Jackson, 2001).

Common communication tools used today rely on the Internet for the sending and receiving of information, such as electronic mail, or email. Stanek and Purcell (1995) highlighted the importance of the Internet:

> Five centuries ago the printing press with movable type brought society past an impasse with elitist control of knowledge and caused a revolution. It made possible the spread of knowledge to anyone with a passion to learn, and what is more important, it gave society an information base independent of a limited number of scholars. Today, the Internet is again causing a revolution in the way knowledge and information can be accessed (p. 418).

World Wide Web

The World Wide Web is one of the many services that utilize the Internet, and it has become so successful that it is often used synonymously with the Internet, despite it being distinctly different (Gilies & Cailiau, 2000). It was conceived in 1989 by Tim Berners-Lee, a software engineer at the European Organization for Nuclear Research (CERN) in Switzerland, as a way to allow information stored on different computers around the world that were all

connected through the Internet, to be accessed in a common way (webfoundation.org). This could be accomplished using three technologies: Hypertext Markup Language (HTML), Uniform Resource Identifier (URI), and Hypertext Transfer Protocol (HTTP). HTML, as its name suggests, is a markup language used to format documents in a way that allow web browsers, which are computer programs designed to read and parse HTML, to properly display the information contained in the documents (Duckett, 2011). A URI provides a simple and extensible way for identifying an abstract or physical resource. It is commonly used interchangeably with URL, or Uniform Resource Locator, though URL is a classification, or type of URI (Duckett, 2011). A URL, according to RFC3986 section 1.1.3, is a subset of URIs that in addition to identifying a resource, also provides a "means of locating the resource by describing its primary access mechanism." For example, cmich.edu/image.jpg would be considered a URI, as it identifies the resource image.jpg. On the other hand, http://cmich.edu/image.jpg would be considered a URL, as it also provides the access mechanism of http. HTTP, the third technology that form the World Wide Web, is a stateless protocol that describes how data can be exchanged over a network (Duckett, 2011), and is the protocol governing Web traffic on the Internet. Gillies and Cailliau (2000) described this process using a post office analogy. Post offices are connected by roads, in much the same way as machines on the Internet are connected by wires, with special trucks that move letters and packages between them. If one were to send a letter or package to someone else, three things would be necessary: the recipient's address, the sender's address, and the message or item (Gillies & Cailliau, 2000). One would simply drop the letter or package off at the post office and it would get sorted, routed, and delivered to the proper location based on the information provided. The same can be said for the way in which information gets sent from machine to machine. One provides information on where the data needs to be sent, the return

address, and the message itself. This information gets broken up into small chucks, called packets, and sent through one or more electronic routing stations (Gillies & Cailliau, 2000). These packets also get numbered so that they can be reassembled in the proper order, allowing the message to make sense when all the packets finally arrive, much like an unbound manuscript would be numbered so the reader can reassemble the pages in the proper order for reading once all the pages have been received.

Today, the product of these technologies take the form of billions of pages of information on nearly every conceivable topic, called web pages. These web pages then contain links, or hyperlinks, to other content and information that might reside on the opposite side of the world. Accessing these web pages require special hardware and software, just as the postal service require special trucks, post boxes, and carriers to deliver physical mail. Network Interface Cards, network switches, many different types of cabling and connectors, routers, and web browsers are a few of the technologies that allow devices to connect to local networks and the Internet to access web pages on the World Wide Web. Wireless connections to the Internet have also become commonplace, with half of all U.S. digital media consumption now being accessed using mobile devices version traditional desktop computers (Lella, 2015).

All this allows students, faculty, and staff access to a tremendous amount of information in a matter of seconds, from nearly anywhere in the world. According to Google Inside Search (www.google.com/insidesearch), there are currently over 130 trillion individual pages on the World Wide Web, including academic journals and publications, crowd-sourced encyclopedias, and even web pages that assist in self-diagnosing medical conditions. While it might seem simple enough to open up a web browser and search for information, many take for granted the complexities of the underlying technologies necessary to make this happen. Chapter I described

many of the necessary skills an IT professional must possess to successful hold a position in the industry. Beyond those found in the postings, it is assumed that all IT professionals know and understand the basics of networking, allowing them to successfully troubleshoot both wired and wireless network connections and devices. Maintaining the physical infrastructure, such as the routers, switches, cabling, and wireless access points requires additional skills and knowledge, and with IT professionals often dedicated to just this area. With the increasing reliance on the Internet and institutional networks by faculty, students, and staff, having skilled IT professionals to support and maintain these technologies is crucial.

Learning Management Systems

While the World Wide Web may be one of the most utilized technologies in education, there are many others that fall into the realm of educational technology, and are often studied by researchers. Learning Management Systems (LMSs), which are sometimes referred to as course management systems, allow the "publication of online content, the organization of activities for learning and course management from a distance" (Muniz & Moraes, 2012, p. 832). McGill and Klobas (1999) pointed out much of the existing literature on learning management systems appeared to be focused on the technology or was limited to studies on adoption, rather than on the impact of teaching and learning. Their quantitative study used Goodhue and Thompson's (1995) technology-to-performance chain framework to investigate the influence that task-technology fit has on the performance impacts of the learning management systems, finding that while task-technology fit had a strong influence on the perceived impact of the LMS, it had a weak impact on the learning outcomes in terms of student grades (McGill & Klobas, 1999).

Highlighting McGill and Klobas' (1999) assertion of technology and adoption-focused extant literature are studies focused on the perceptions of learning management systems and the

usability and features of such. Handal, Groenlund, and Gerzina (2010) focused on student perceptions of the LMS, finding that students' practical preference was for its use as a resource repository, rather than for high-order learning activities such as online discussion forums. Motaghian, Hassanzadeh, and Moghadam (2013) as well as Lochner, Conrad, and Graham (2015) looked at faculty perceptions of the LMS. Motaghian, Hassanzadeh, and Moghadam (2013) found that the perceived usefulness, ease of use, and system quality significantly increased instructors' intention to use web-based learning systems, while Lochner, Conrad, and Graham (2015) found that secondary instructors had a general lack of awareness about the varying learning management systems and were concerned about personal adequacy in adopting the use of an LMS.

From a usability and features standpoint, Dobre (2014) attempted to enumerate current offerings in the LMS space across the globe, splitting them up into three categories: Open-source, proprietary, and cloud-based learning management systems. Dobre (2014) found the greatest usage coming from the open-source category, with Moodle leading the way with 20 percent of 2009 respondents indicating its use. Muniz and Moraes (2012) studied the usability issues of learning management systems, focusing on Moodle, and found issues with the forums and chat tools of the LMS. Lonn, Teasley and Krumm (2011) compared student LMS usage between large residential campuses and smaller commuter campuses, and found that residential students value activities that support learner-content interactions, whereas commuter students value those fostering learner-learner interactions. Van Rooij (2012) developed a predictive model for US higher educational institutions in choosing whether or not an institution would select the use of open-source software for the learning management system, utilizing the institutions' Carnegie Classification, previous experience with open-source software, focus on student

learning, and commitment to the organizational self-reliance. On the other end of the selection spectrum, Kim and Leet (2007) developed an evaluation for the selected learning management system based on seven criteria: instructional management, interaction, evaluation, information guidance, screen design, technology, and organizational demand. Cuellar, Delgado and Pegalajar (2011) studied the need to develop an ontology of e-learning systems that would allow organizations to utilize multiple learning management systems and share data between them for reporting purposes. None of these studies, however, considered the impact the learning management system has on IT professionals. Given the complexities of learning management systems and the high availability required of these systems, the impact on the IT professionals who oversee these systems could be rather significant.

iPads

Another technology that has been used for educational purposes and studied by researchers is the Apple iPad. Carr (2012) studied the impact of iPads on math scores at the 5th grade level, finding no significant different in pre-test and post-test scores. Similarly, Souleles, Savva, Watters, Annesley, and Bull (2015) found many obstacles in embedding the use of iPads into art and design education, such as student preference for tactile learning experiences, rather than digital. Cumming, Strnadova, and Singh (2014) looked at the process and outcomes of introducing iPads to students with developmental disabilities in a private high school, finding that it enhanced learning opportunities for that demographic. Aagard, Armstrong, Cooper, and Nuxoll (2013) as well as Lane and Stagg (2014) focused outside of the classroom, investigating the impact on library staff and the factors influencing adoption for university staff, respectively. Aagard et al. (2013) found that the introduction of iPads transformed the internal culture and working relationships within the library, while Lane and Stagg (2014) found that the devices

were considered easy to use by staff, but the lack of IT support for end-users made it difficult for many staff members, especially the older personnel. Not focusing on a particular population, Nguyen, Barton, and Nguyen (2015) looked at the current state of research exploring iPads in higher education and found that while students hold a positive attitude about using the devices in their learning, some faculty viewed the devices as a distraction and were hesitant to allow them to be used. Though many aspects of this technology have been considered, there is a lack of research on how this might impact those who must support the devices, the networks in which they attach, or the applications that get installed and used.

Personal Response Systems

Personal response systems, also called student response systems, are another educational technology used inside of classrooms. Most commonly referred to as "clickers," these devices are handheld wireless transponders, similar to small remote controls, that allowing students to respond in real-time to questions and surveys (Patry, 2009). Like the iPad, these devices have also been studied from a variety of angles. Kolikant, Drane, and Calkins (2010) looked at science and math courses in research-intensive institutions in the Midwest United States and found that significant changes to course design needed to happen before the benefits of clickers were realized, making substantial pedagogical and technological support beneficial. Blasco-Arcas, Buil, Hernandez-Ortega, and Sese (2013) investigated the effects of clickers on student performance in social science degrees, revealing that the high level of interactivity with peers and with the teacher that is promoted by these devices positively influences active collaborative learning and engagement, and therefore improves student learning performance. Moratelli and DeJarnette (2014) found that literacy test scores for 5th grade students increased 59 percent after four weeks of clicker implementation, with the largest affected population being under-

performing students. Wang, Chun, and Yang (2014) found that high school geometry students who used clickers in their classrooms showed improvements in learning outcomes and class participation versus those that did not use them in class. Patry (2009) surveyed 516 higher education students in search of their perceptions of clickers and found that 46 percent of respondents believed that clickers were most helpful in understanding course materials, while 20 percent indicated that clickers were most helpful in exam preparation. Hawkins (2011) found that community college courses in Maryland that used clickers had a significantly higher retention rate than those that did not. DeGagne (2011) reviewed existing literature around the use of clickers in nursing education and found that clickers have the capability to foster student satisfaction and enhance learning engagement and participation among nursing students. Han and Finkelstein (2013) investigated the effects of university professors' clicker development on student perceptions of clickers and found that students perceive clickers as having an impact on engagement, and that professors' clicker development directly impact student perceptions of the devices. No matter the setting, whether it is in a K12 classroom or in a higher education course from a research-intensive institution, there exists a great need for technology support for educational technology and mobile devices, making the role of the IT professional essential for student success.

Computer Labs

As Martinez-Mateo, Munoz-Hernandez, and Perez-Rey (2010) stated, "computer labs are one of the most popular IT infrastructures for technical training in primary and secondary schools, universities, and other educational institutions all over the world." These labs can be configured in many different ways, with different operating systems and software on the workstations, unique printing needs, special access for instructors and teaching assistants, and

with consideration for saving and sharing files across machines and labs (Pickrell 2013). The use of thin clients has been considered for both general computing labs (Martinez-Mateo et al., 2010) and for special purpose labs, such as telecommunication classes (Armitage and Harrop, 2005). The use of low-end or refurbished machines (Agyei-mensah & Ndahi, 2006) as well as laptop machines (McKimmy, 2005) have been studied as a means of lowering the cost of creating and maintaining computer labs. While the rate in which technology and technological needs has outdated much of this research, the need for space to allow students to work together collaboratively using technology is still present. While some institutions are moving away from the traditional computer labs to open spaces for student collaboration, there will still be may technological needs students will require to be successful. Video displays, such as large flat-screen televisions or projectors will be required for students to connect wireless devices to share and discuss information, and a robust wireless network with ample sources of power to keep devices charged may still be necessary (Terris, 2010). Whether traditional labs with specialized software, or bring-your-own-device collaboration spaces, knowledgeable IT professionals will still be required to provide support for these technologies, yet little has been studied as to the impact these areas have on IT professionals working in higher education.

Technology and Student Learning

Technology continues to play an increasingly important role in the success of students in higher education, both in terms of engagement and outcomes. As such, there have been many studies that have considered the different educational technologies and the impact those technologies have in the classroom, whether that be physical or virtual. Hepplestone, Holden, Irwin, Parkin, and Thorpe (2011) conducted a literature review on using technology to provide feedback to students and the impact on student engagement, and generally found that technology

has the potential to enhance engagement by allowing feedback to be published online to be consumed and reflected upon at a convenient time by students in the absence of their peers. Boscardin and Penuel (2012) conducted a literature review on the benefits of personal (audience) response systems and found that there is a general consensus to the assertion that these are effective tools for increasing learner engagement through active participation. Chen, Lambert, and Guidry (2010), Zhu (2006), and Sun and Rueda (2012) all considered the impact of web-based learning technologies on student engagement. Chen et al. (2010) found there is a positive relationship between course-related technology and student engagement, especially in lower-division courses. Zhu (2006), on the other hand, found that interaction does not simply occur due to the use of the technology, but rather through the discussions being intentionally integrated into the course design by instructors. Sun and Rueda (2012) concluded that the use of online activities through discussion boards and other multimedia content increases student interest and emotional engagement, but additional technical help should be provided to students taking their first online courses to assist in easing anxiety around such tools. Junco, Heibergert, and Loken (2010) researched the effect of Twitter, a microblogging and social networking platform, on engagement and outcomes, finding that the group of faculty and students who used Twitter for course discussions were more engaged in the course work, and students had a higher semester grade point average than the group of faculty and students who did not utilize Twitter.

While ample research has been conducted around different technologies, such as web-based learning environments and personal response devices and the impact on student learning, little has been researched on IT professionals and how the work they do impacts student learning. Equally important to note is that little has been researched on the impact student learning and engagement have on IT professionals, which might have implications to the way in which IT

professionals approach the implementation, configuration, and support of educational technology.

Technology and Operational Effectiveness

Another aspect of educational technology that not only affects learning, but the effective operations of the institution lies in the technology used by administrators. Course registration systems allow students to browse and schedule courses using web browsers (Takeshita & Maeda, 1999) and mobile devices (AlBastaki & Aljeeli, 2005; AlBastaki, 2012), but require administrators to supply course and section availability and manage room and staff availability. This information feeds into Student Information Systems (SIS), which keeps official records of student grades, transcripts, and academic progress and is utilized by both administrators and student advisors to support students in program completion. Customer Relationship Management (CRM) systems are used to assist in the recruitment and retention of students (Kosch, Friedrich, & Breitner 2012; Seeman & Ohara, 2006; Rigo, Pedron, Caldeira, & DeAraujo, 2016), as well as to help in communicating with alumni and donors and general program marketing (Tapp, Hicks, & Stone, 2004; Gordan, Apostu, & Pop, 2012). Financial Information Systems support the accounting and payroll efforts of the institution. Document imaging systems allow many different document types, such as student transcripts, accounts payable and receivable, and purchase orders to be digitized and electronically routed between colleges and departments, saving time and materials in comparison to using paper copies. Administrators have begun utilizing student and faculty data for decision making purposes (Agaoglu, 2016) which require data warehouses and data marts to be created and maintained, as well as executive dashboards to be created for easy consumption of information by university administrators.

The creation of data marts for executive dashboards, modifications to student and financial information systems to ensure regulatory compliance, and the behind-the-scenes workflow for routing documents between departments, for example, all require skilled IT workers. The proper maintenance, enhancement, and support of these technologies is essential for universities to maintain and improve operational effectiveness, and this requires knowledgeable IT professionals. While much research exists on the various technologies used in higher education to improve operational efficiency, little research exists on how the use of technology in this regard impact IT professionals or how the decisions around the use of these technologies to gain efficiencies for institutions might impact this group of employees.

While neither list of technologies used in or outside of the classroom in higher education discussed above are exhaustive, this section provides an overview of the many different facets of technology that must be properly installed, configured, and maintained for use in educational institutions. Supporting all these critical technologies requires skilled IT professionals to ensure they are both available and reliable when they are needed by students, faculty, and staff. While much research exists around each type of technology, its use in supporting the instructional and administrative functions of the university, its impact on student learning, and the effects on operational efficiency, little research has been conducted on how educational technology impacts IT professionals working in higher education. The use of technology for educational purposes has changed dramatically over the past century and shows no sign of slowing down, nor does the apparent dependency on these technologies by faculty, students and staff. To ensure universities can continue to embrace existing technologies and prepare for what's to come, it will be extremely beneficial for institutions to better understand the IT professionals responsible for installing, configuring, and supporting these technologies.

IT Employee Motivation

The previous section discussed some of the myriad of technologies used for educational purposes, providing a broad overview of the knowledge and skills an IT professional working in higher education must possess to effectively support the faculty, students, and staff of an institution. Another aspect that contributes to the essence of being an IT professional working in higher education is the motivation behind that employment decision. Ryan and Deci (2000) stated that to be motivated means to be moved to do something, and that "a person who feels no impetus or inspiration to act is thus characterized as unmotivated, whereas someone who is energized or activated toward and end is considered motivated" (p.54). This motivation is generally viewed in one of two ways: intrinsically or extrinsically. Intrinsic motivation occurs when internal factors inspire individuals to act (Tonial, 2009), such as job responsibility, recognition, career advancement, and challenging work. It refers to the way in which an individual will do something because it is inherently interesting or enjoyable (Ryan & Deci, 2000). For example, IT professionals generally enjoy challenging and innovative work as it offers opportunities for growth and development (Tonial, 2009). Conversely, extrinsic motivation can be described as the completion of a task with the expectation of receiving an award for the end result (Jenkins, 2001), such as salary, paid leave, and benefits. While extrinsic motivators do not necessarily instill excitement in IT professionals, a group that are expected to "stretch their thinking, push their ideas, and persevere to solve tough, unyielding problems," (Katz, 2005) they are just as important to understand as the intrinsic motivators to ensure the needs of IT professionals are met.

Motivational Factors

Understanding what motivators work best in a given situation is key to motivating IT professionals at individual, team, and organizational levels (Singh, 2016). As such, much research has been conducted to better understand the motivational factors that influence IT professionals. Kenan-Smalls (2011) considered leadership style as a motivational factor and found differences among generations of IT professionals in terms of interaction and preferred leadership style throughout the different age brackets. As an example, Kenan-Smalls (2011) found that there is a statistically significant difference between Traditionalists (born between 1900 and 1945) and Baby Boomers (born between the years of 1946 and 1964) in terms of transformational leadership, indicating that Traditionalists have a greater preference for transformational leadership than Baby Boomers, which, in turn, impacts motivation. Mitchell (2015) considered leadership style as well, though focusing on Generation Y (those between the ages of 20 and 33) and found that IT professionals claimed to be more motivated when leaders led by example, provided freedom and autonomy, and possessed great listening skills. LaFalce (2012) looked at work-related stress as well as the effects of transformational leadership style on employee satisfaction and motivation, finding a statistically significant correlation between both work-related stress and job satisfaction and between transformational leadership qualities and job satisfaction. Temple (2013) considered pay, supervision, people, and opportunities for promotion, finding that of these factors, the relationships with coworkers was the largest contributor to job satisfaction and motivation. Holmes (2006) explored a variety of motivational factors and their effect on IT employee motivation and retention, such as demographic factors and employee benefits, and found that the variables which had the most impact on motivation

and the potential to retain IT workers were vacation, health insurance coverage, and job flexibility.

Retention

Another important aspect in understanding the motivation of IT employees is turnover. The retention of qualified IT professionals is at an all-time low within educational institutions (Holmes, 2006). Turnover of IT professionals in colleges and universities can be extremely problematic and puts a strain on budgetary resources. For example, the costs associated with filling a single position in a college or university can reach up to $10,000 after accounting for recruiting, advertising, interviewing, and loss of productivity (Holmes, 2006). Another estimate places the cost of replacing an IT employee between 25 and 100 percent of his or her salary (Burnes, 2006). This can put undue burden on educational leaders, as training and development costs might increase, and the quality of services provided to faculty and staff might decrease (Abii, Ogula, & Rose, 2013). As demonstrated in the previous section, with the need for skilled IT professionals to support the various educational technologies in and outside of the classroom being essential for faculty and student success, keeping turnover of IT professional turnover low minimizes the impact on teaching and learning. Exacerbating this issue, qualified programmers, systems and networking professionals, and skilled computer personnel, which are critical resources for any IT organization, are difficult to find (Mak & Sockel, 2001). It is no surprise that attracting, developing, and retaining qualified IT staff returned as the top executive management concern in 2008 for public sector leadership (Coombs, 2009).

Retaining highly skilled, qualified IT professionals is essential for the success of any institution and has been studied by many researchers through motivational lenses. Compensation in the form of salary, benefits, and incentives has been considered as a factor for job satisfaction

and the intention for turnover. Davis (2013), Abii, Ogula, and Rose (2013) as well as Holmes (2006) all found that compensation is an important factor in predicting an employee's intention to leave an organization. Davis (2013) also considered employee morale and found that it, too, is an important factor in an IT employee's decision to remain with their employer. Workplace relationships was also found to be a factor that influenced job turnover (Abii, Ogula, & Rose, 2013; Temple, 2013). Coombs (2009) considered employee attitude and found it to be a strong predictor of employee retention. While Smerek and Peterson (2007) found that the work itself is a strong predictor in job satisfaction and the retention of IT professionals, Boatright (2014) found no significant relationship between the design of the work and turnover intention. Govaerts, Kyndt, Dochy and Baert (2011) found a positive relationship between age and retention in regards to an employee's intention to remain with their current employer, while Sanchez (2010) found that job satisfaction, leadership outsourcing, and family were all factors that contributed to the intention of IT professionals to leave an organization. Bullock (2011) studied the relationship between burnout and employee engagement of IT professionals and found that, while IT professionals' job demands are indicative of burnout, there is little difference between that of IT professionals and non-IT professional employees while considering those working for a hospitality company.

While quantitative research exists that focuses on a variety of motivational factors, very little has been studied from a qualitative perspective, especially when considering IT professionals working in higher education. Understanding the lived experiences of IT professionals who work in higher education and how these experiences might have shaped their underlying motivation is important to better understanding the essence of being an IT professional.

IT Motivation and Student Learning

Motivating factors that affect student learning have been considered by researchers from a variety of perspectives. Allen (1999) looked at the direct and indirect motivation on persistence behavior and academic performance in college, finding that non-minority and minority students' motivation to persist was influenced the most by high school rank, parents' education, and academic performance during the freshman year. Hudy (2006) came similar conclusion in that, when considering College Student Inventory (CSI) variables measuring academic motivation, high school percentage rank was the most significant variable for predicting GPA. Kusurkar, Cate, van Asperen, and Croiset (2011) conducted a literature review on motivation as both an independent and dependent motivator in medical education, finding that as an independent variable, motivation affects learning and study behavior, as well as academic performance, where as a dependent variable appears to be affected by demographics such as age, gender, ethnicity, and socioeconomic status that cannot be manipulated by educators. Jaasma and Koper (1999) investigated out of class communication between instructors and students and student motivation, finding a positive relationship between out of class communication with instructors and student motivation, but negatively if those communications revolved around course work. Murage (2003) found that faculty were more intrinsically motivated to incorporate computer-mediated communication tools into their courses than any extrinsic factors. Bird and Morgan (2003) as well as Holder (2007) considered motivational factors impacting student persistence in online programs, finding that clear goals, belief in ability to achieve (Bird & Morgan, 2003), as well as emotional support, self-efficacy, time management, and learner autonomy (Holder, 2007) were all factors that influenced a student's motivation to persist in online programs.

These are but a few examples of the different motivational aspects of student learning that have been studied. As with educational technology, little research has been conducted on how student learning impacts IT professionals and their intrinsic and extrinsic motivation. It would be plausible that student learning would impact the motivation of any higher education personnel, which would include IT professionals, yet little has been considered in this regard. Understanding how student learning might affect the motivation of IT professionals to choose to work in higher education would be valuable to institutions, having both recruiting and retention implications.

IT Motivation and Operational Effectiveness

Colleges and universities throughout the United States continue to be under enormous pressures by students, parents, and state and federal government to ensure the costs of higher education are as affordable as possible (Lahey & Griffith, 2002). On top of keeping costs low, university administrators also seek to ensure students are provided with the best experiences while working with non-academic systems, such as to register for classes and paying tuition bills to help retain current students. Universities often turn to technology to assist in finding ways to increase efficiency and effectiveness. Dewett and Jones (2001) described information efficiencies as the cost and time savings that result when technology allows individual employees to perform their tasks at a higher level, assume additional tasks, and expend their roles in the organization. Universities utilize document imaging systems to allow paper documents such as invoices, purchase orders, and student transcripts to be scanned and routed throughout the institution electronically, rather than hand delivered and stored in physical filing cabinets. Customer relationship management (CRM) systems are used to provide an easier method of communicating and tracking interactions with students (Seeman & O'Hara, 2006).

Real-time collaboration and communication tools such as WebEx and Skype eliminate time and space barriers and are used by administrators for meeting and training (Twine & Brown, 2011), while faculty use these tools outside of the classroom for office hours (Carroll & Sheng, 2007). Online course delivery has been viewed as a way for universities to both reduce costs of course offering, and reaching students outside of the university's geographical region (Inglis, 2006; Bartley & Golek, 2004). Changing the university's telecommunications infrastructure to utilize Voice over IP (VoIP) has been studied as a way to reduce operational costs while still providing staff the necessary tools to communicate with university stakeholders (Schaffhauser, 2008).

While studies have been conducted on ways to improve operational effectiveness and reduce organizational costs through the use of technology, and while universities spend considerable time and resources considering ways to accomplish these tasks, little has been done to understand the impact this might have on the IT professionals charged with maintaining the technology. Gaining a better understanding of how helping the university be more operationally effective might impact an IT professional's extrinsic and intrinsic motivation may provide insights into additional ways of improving retention rates of IT employees as well as further increasing operational effectiveness.

Many studies have considered the intrinsic motivation, such as challenging work, recognition and career advancement, as well as the extrinsic motivation such as salary, paid leave and benefits of IT professionals, both in the private industry and in higher education. Much of this research focused around the retention of IT employees, which can cost universities upwards of nearly $10,000 per lost position. Motivating factors that affect student learning have been considered through a variety of lenses, though few, if any, have considered the impact student learning might have on IT employee motivation. Similarly, while researchers and administrators

have focused on making university operations run more effectively through the use and implementation of technology, few have considered the impact on the IT professionals charged with maintaining the technology.

The Culture of IT

Culture is the pattern of beliefs and expectations shared by the organization's members (Schwartz & Davis, 1981). A more in-depth definition was provided by Schein (2010), stating that culture is:

> A pattern of shared basic assumptions learned by an organization as it solved its problems of external adaptation and internal integration, which has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems. (p.18)

While many different definitions of culture exist, such as those highlighted by Martin (2002, p.56-58), there exists many common attributes among them. Ehrhart, Schneider, and Macey (2013) described many of these commonalities, such as that organizational culture is symbolic, expressive and subjective; organizational culture is grounded in history and tradition; organizational culture is transmitted to new members; organizational culture is stable. Many of these attributes are quite apparent when considering culture through the lens of higher education. College sporting events embody the notion of symbolism and expressiveness, with team mascots leading cheers such as "fire up Chips," "roll Tide," and "we are Notre Dame." Student body amass in the stands wearing their school's colors, faces painted, and attempt to out cheer the opposing school. Traditions, rites and rituals, such as degree conferment, Greek "rush," and even student housing selection are small parts of what defines each institution's culture and makes them unique. College classrooms, which highlight both tradition and stability, and may be one of

the oldest across all industries, as many researchers argue that little has changed over the last century. As Luterbach and Brown (2011) stated, “the industrial age model of schooling has remained in place, with its uniform instructional goals to be achieved simultaneously by classroom groups of students in preparation for a norm-referenced end-of-course or end-of grade test” (p.24).

Maassen (1996) looked at the existing literature around culture and higher education and generally found that the two general areas of studies, disciplinary culture and organizational culture, have focused only on analyzing the relationship between either the institution or the discipline and academic culture without considering other variables. Maassen (1996) then offered an alternative definition of culture specific to higher education: “Academic culture is the set of attitudes, beliefs, and values that integrates a specific group of academics” (p.158). Maassen (1996) argued that this definition allowed studies to be conducted on other areas of higher education culture, leading to a more effective relationship between institutional administrators and academic decision makers. One area that has been generally absent is the impact that academic culture has on IT professionals working in higher education, and in turn, the impact that IT professionals have on the overall academic culture.

IT as a Subculture

Organizational subcultures consist of distinctive clusters of ideologies, cultural forms, and other practices that identifiable groups of people in an organization exhibit (Trice & Beyer, 1993). They differ from the organizational culture in which they are embedded; they may intensify the aspects of the predominant organizational culture or diverge from it altogether (Trice, 1993). Martin and Siehl (1983) suggested three conceivable types of subculture: Enhancing, orthogonal, and counterculture. Enhancing subcultures adhere to the core values of

the dominant culture more fervently than in the rest of the organization, while countercultures hold core values that are of a direct challenge to the core values of the dominant culture (Martin & Siehl, 1983). Orthogonal cultural members accept the core values of the dominant culture, along with a second set of un-conflicting values that are particular to themselves (Martin & Siehl, 1983). Information technology is one of the distinct subcultures within a college or university (Dumont, 2011), and one might argue that this subculture sits within the orthogonal type of culture. While information technology departments in higher education focus on supporting the central financial and academic activities of an institution (Dumont, 2011) and accept the core values of the university, IT professionals are also loyal to the profession itself (Harold, 1988).

As culture is unique to each organization, moving to a new position and assimilating into a new culture can be challenging. The way in which problems are tackled and how peers interact might be vastly different from one place to another. Exacerbating this is the fact that people carry culture with them; when they leave one group setting for another, they do not shed the cultural premises of the first setting (Becker & Geer, 1960). This can be especially true for those working in information technology, as each technology department may differ greatly in the way in which work is performed. One university's IT department may hold tightly to a defined set of practices such as the Information Technology Infrastructure Library (ITIL), where others may have loose restrictions on how service is provided or new technology is released. The software developers in one organization may utilize a completely different software development life cycle (SDLC) methodology than another. One organization may work in silos, completely separating out the different types of IT work, where some work more openly and collaboratively across functional domains. As such, it takes ample time and effort to become acclimated with the cultural

differences between organizations, despite the underlying work or technologies remaining relatively the same.

Regardless of the organization, IT professionals share some generally accepted characteristics. Harrold (1988) highlighted IT professionals' low need for social interaction, low tolerance for interpersonal conflict, and low identification with authority, as well as being introverted and intuitive. IT professionals also tend to define themselves and their value in terms of quantity and complexity of mastered skills (Enns, Ferratt, & Prasad, 2006; Dumont, 2011). An empirical study conducted by Garcia-Crespo, Colomo-Palacios, Miguel-Gomez, and Tovar-Caro (2008) on the way in which television portrays IT workers reflect common perceptions of the profession highlighted some additional stereotypes of IT professionals: Nerdy, intelligent, skilled in mathematics and programming, boring, solitary, unethical, and poorly dressed. Whether these traits are truly reflective of today's IT professionals working in higher education or simply outdated stereotypes of misguided media, it helps demonstrate how this subculture is often viewed from the perspective of the larger, dominate culture.

Leidner and Kayworth (2006) conducted a review of literature around the linkages between IT and culture and provided some general themes. The first was around culture and information systems development, in that variation across cultural values may lead to different perceptions and approaches to the manner in which information systems are developed. For example, institutions that place a higher value on process than people may invest more heavily on technology to enhance or increase business processes. The second theme involved information technology adoption and diffusion. Institutions less comfortable with technology are less likely to adopt and use new technology (Leidner & Kayworth, 2006). The third theme discovered in the literature review was around technology use, in that cultural values shape how

people use information technology. This becomes quite apparent when considered across industries, such as the use of technology in a manufacturing plant compared to technology used in teaching and learning. Another theme that emerged was the impact IT had on culture. Not only do different types of technological artifacts influence certain cultural values, but IT has the potential to assist in organizational culture re-engineering efforts (Leidner & Kayworth, 2006). This could certainly be seen during large-scale IT projects, such as the replacement of a student information system or a help desk ticketing system.

Colleges and universities are complex cultures that "create, order and manage information, and, as with any organization, they are constituted as dense information networks wound together by ideological and technical strands" (Privateer, 1999, p.61). Understanding the role IT professionals play in the organization is critical for universities to succeed, as they help form and define not only their own subculture, but the overall culture of the organization.

IT Culture and Student Learning

The impact of culture on students and student learning has been considered since the late 1950s. Pace and Stern (1958) created the College Characteristics Index in attempt to develop an instrument to measure student perceptions about their institutions to provide administrators insight into specific aspects of culture of one or more universities. This led to additional research being conducted on student culture, such as Clark and Trow's typology of student culture and Peterson's College Student Questionnaire (Maassen, 1996), as attempts were made to describe the impact of college culture on students. Noticeably absent from Leidner and Kayworth's (2006) literature review on IT and culture was research around IT culture and student learning. As discussed further below, it becomes apparent when considering the impact that IT culture has on operational effectiveness that this might also impact student learning. If the culture of IT

departments inside of higher education value a relaxed environment where processes do not exist around incidents, the systems that students rely upon may become unavailable, thereby negatively impacting students' ability to access necessary content. For example, if an institution's learning management system was to become unavailable due to the way in which software updates are released and there is no defined process for quickly reestablishing service, students may be unable to access content, submit exams, or participate in online discussions for an extended period of time. Conversely, if defined processes around releases and incident management exist, downtime might be minimized or altogether avoided. This is dependent on the culture of the organization and the values held by IT professionals.

IT Culture and Operational Effectiveness

Beyond the technology, which has many ways to improve operational effectiveness and have been discussed in the sections above, the culture of the IT organization can impact the effectiveness of both the IT organization as well as the larger university. Information Technology Infrastructure Library (ITIL) is a framework outlining best practices in information technology service management. In an academic setting, the service operations component might be the most recognizable by faculty and staff, as it includes areas such as request fulfillment (password reset, software install, etc.), and incident management (a system is unresponsive or unavailable). Potgieter, Botha, and Lew (2005) found that as activities in the ITIL framework increase, so do customer satisfaction and operational performance. Eikebrokk and Iden (2016) had similar findings, but also found a positive relationship exists between ITIL implementation and IT service culture.

Collaboration is one cultural aspect of IT professionals that can also impact operational effectiveness. Some IT organizations operate in functional silos, with little collaboration between

functional domains. Software developers write code, network engineers oversee the physical and logical network, application administrators install and maintain applications, etc., all with little interaction amongst the groups. This can lead to increased latency when projects or tasks cross boundaries, difficulties in communication, and in turn, negatively impact the organization (Cois, Yankel, & Connell, 2014). DevOps is a movement within software engineering that attempts to break down the silos between developers and the operations staff, who are often viewed as a conglomeration of those IT professionals charged with maintaining the infrastructure, quality control, and those responsible for pushing the releases into production. Tighter collaboration and integration of these different IT teams, combined with automating as much of the process as possible, helps to maximize both the quality of the software, and the productivity of the organization (Cois, Yankel, & Connell, 2014).

Whether it is following standards such as ITIL or implementing more efficient development methodologies, the culture of the IT organization inside of universities can have a direct impact on the efficiency of the overall organization. It is therefore important for university leaders to better understand the culture of their IT organization, and how it affects the goals and mission of the university. It might also be desirable to better understand how university decisions made around operational effectiveness impact not only the culture of IT, but the IT professionals, an area in which little research exists.

While many definitions of culture exist, most revolve around the attitudes, beliefs and values of the organization and the stakeholders within. Within the larger culture of a university, there exists an IT subculture, wherein IT professionals hold not only to the values of the university, but to a potentially separate set of values of their own that have implications on both student learning and operational effectiveness. While researchers have focused on the impact of

culture on both student learning and operational effectiveness, little is known about the impact these have on IT professionals. Whether it is following standards for incidents or software development, the way in which a service desk handles support requests, or the way in which processes are put in place to provide operational efficiencies, is all dependent upon the culture of the organization, and the values held by IT professionals. Understanding the role IT professionals play in the organization is critical for universities to succeed, as they help form and define not only their own subculture, but the overall culture of the organization.

Conceptual Framework

The conceptual framework used in this study to explore the essence of being an IT professional working in higher education is drawn from the themes found in literature pertaining to this group of people. Technology continues to play an increasingly important role in the lives of the students, faculty, and staff in universities. Its positive impact on teaching and learning has been studied from various perspectives, and has been shown to be increasingly dependent upon for the success of universities in this digital age. While being an important aspect in teaching and learning, it is also part of what makes an IT profession an IT professional. As Enns et al. (2006) and Dumont (2011) stated, IT professionals tend to define themselves and their value in terms of the quantity and quality of technology-related skills they have mastered.

Colleges and universities are complex cultures that "create, order and manage information, and, as with any organization, they are constituted as dense information networks wound together by ideological and technical strands" (Privateer, 1999, p. 61). This culture plays a significant role in how an IT professional fulfills his or her duties. It has implications as to the way in which technical problems are viewed, as well as the way solutions are created and implemented. The subculture of IT can be viewed through the ways in decisions are made,

support is provided, and the interactions with peers and other stakeholders. All of which contribute to the essence of being an IT professional working in higher education.

The motivational factors behind the work that IT professionals perform and the reasons they choose to do it is another area that has been considered by many researchers. Both the extrinsic motivators, such as salary, paid leave, and benefits, as well as the intrinsic motivators, such as recognition, career advancement and challenging work have been studied and found to impact IT professionals' employment decisions.

By combining these elements, I created a framework as part of the overall theoretical framework to be used as a lens in guiding the collection and analysis of data. Figure 1 below provides an overview of this framework. At the individual level, these three areas, technology, motivation, and culture, help to define the essence of being an IT professional working in higher education. As shown in the Figure 1, there is a relationship between each of these areas and the impact they have on the individual IT professional. As the technology changes or the meaning that is applied to the technology changes, it might alter culture, or the motivational needs of IT professionals. Changes in either the extrinsic or intrinsic motivational factors might impact the culture of the organization, and therefore the individual technologies chosen or the meaning ascribed to those technologies. Likewise, changes in the institutional or organizational cultures could impact both the motivation of IT professionals, and the specific technologies chosen in support of the different functions of the institution. There is also a relationship between the individual IT professional and the larger organization in terms of student learning and operational effectiveness. In much the same way as the individual elements impact one another, each could have an impact on the organization as well. The technology implemented by an IT professional may have an impact on student learning, and so forth. This relationship also goes

both ways, in that the decisions made by the organization to increase operational effectiveness or improve student learning can directly impact the motivation of the IT professional, the technology implemented and supported, or the overall culture of the organization. Both the organization and individual are also influenced by external factors, such as enrollment decline or growth, changes in local or federal laws, and other variables outside the control of the institution.

Utilizing this framework will inform how the researcher collects and analyzes data, and it helps ensure the essence of being an IT professional working in higher education in the state of Michigan can be discovered.

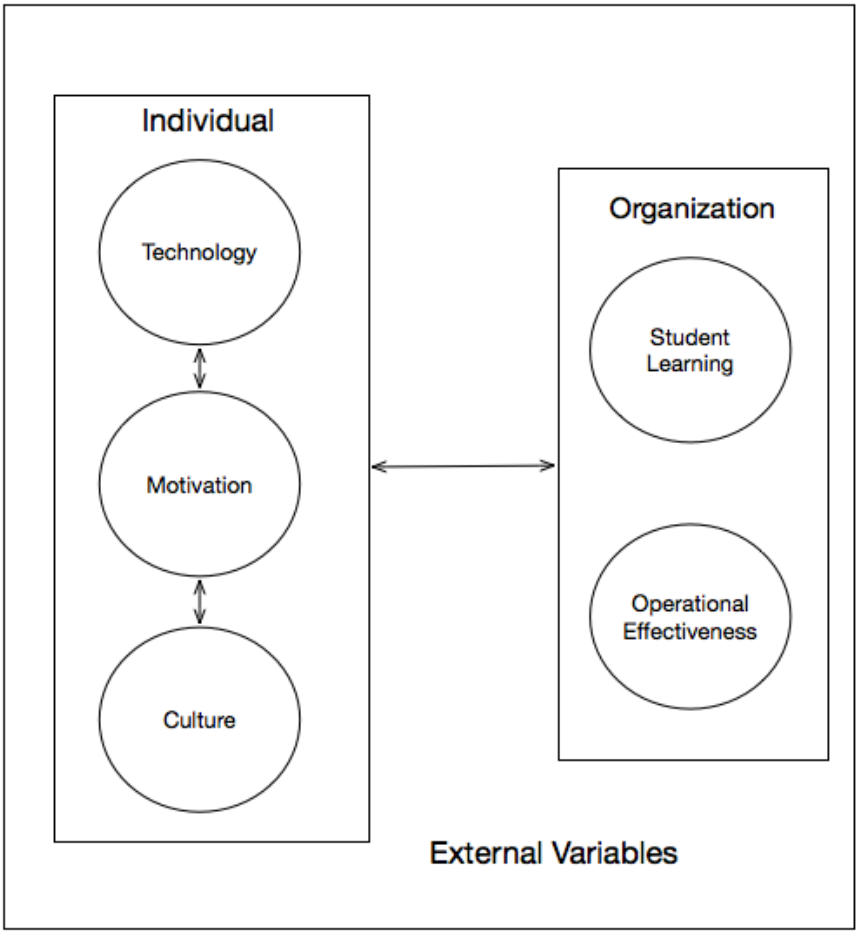

Figure 1. Conceptual Model

Conclusion

The purpose of this phenomenological study was to explore the essence of being an IT professional working in higher education. The focus of this study was to gain an understanding of the technical and cultural needs of IT professionals working in higher education. This chapter reviewed existing literature surrounding educational technology, IT employee motivation, and IT culture, as well as the impact that each of these might have on both student learning and operational effectiveness, providing further evidence of the need to better understand what it means to be an IT professional working in higher education.

The use of technology for teaching and learning has changed drastically over the last century. The Internet and the World Wide Web provide billions of pages of information on nearly every conceivable topic, and is available anytime, from nearly any location. Learning management systems allow students access to course content, take examinations and quizzes, and engage in discussions with faculty and peers asynchronously, without the need for dedicated classrooms or meeting times. Personal response systems provide engaging interaction in classrooms, allowing students to response in real-time to questions and surveys provided by the instructor intended to solicit in-depth thoughts on various topics. Computer labs provide spaces for students with technology access issues to be able to work on assignments or access specialty software otherwise unavailable to them. Existing literature highlights the positive impact technology has on student learning and outcomes. Technology that both students and faculty have come to depend upon to be successful in this digital age.

On the other side of the house, university administrators rely on technology to perform the functions necessary to keep the university running effectively and to provide sufficient services to university stakeholders. Course registration systems allow administrators to supply

students with up-to-date course and section availability and to help make decisions around additional need. Student Information Systems house official records of student grades, transcripts, and academic progress. Customer relation management systems assist in the recruitment and retention of students. Financial information systems support the accounting and payroll efforts of the institution. Document imaging systems allow documents to be digitized and routed efficiently between colleges and departments. These, and many more systems, are depended upon by university administration to not only efficiently run operations, but to make strategic decisions around future endeavors. These systems are designed, implemented and supported to provide the best experiences possible to students and help ensure their academic success. Without these technologies, modern day university operations would come to a grinding halt. The proper maintenance, enhancement, and support of these technologies is essential for universities to continue operation, and requires knowledgeable IT professionals to oversee these functions.

While much research exists on the various technologies used in higher education to improve operational efficiency and student learning, little research exists on how the use of technology in this regard impact IT professionals or how the decisions around the use of these technologies to gain efficiencies for institutions might impact the people and culture of IT. Herein lies an opportunity to fill in a gap in the literature relative to IT professionals who work in higher educational institutions. Examining this group of individuals and their lived experiences as IT professionals working in higher education will allow educational leaders to better understand the needs of IT professionals, how best to interact and motivate them, and develop or modify proper recruitment and retention strategies to hire and retain this highly skilled group of employees and help ensure organizational goals can be accomplished.

CHAPTER III

METHODOLOGY

Technology continues to have a positive impact on universities, both in teaching and learning and the effectiveness in which the university operates. As students, faculty and staff become increasingly dependent upon technology, the importance of having skilled IT professionals to implement, maintain, and support the technology becomes increasingly crucial. Examining IT professionals and their lived experiences will allow educational leaders to better understand their needs, how best to interact and motivate them, and develop or modify recruitment and retention strategies to hire and maintain these pivotal members of the organization. The purpose of this phenomenological study was to explore the essence of being an IT professional working in higher education. The focus of this study was to gain an understanding of the technical, motivational, and cultural needs of IT professionals working in higher education. This was a qualitative, phenomenological study that included IT professionals working in four-year, degree-granting institutions in the state of Michigan in a full-time capacity for at least the past two years. This chapter will include information pertaining to the research methodology, design, targeted populations, and data collection and analysis.

Research Question

Research question for this phenomenological study was: What is the essence of being an IT professional working in higher education?

Theoretical Framework

Jones, Torres, & Arminio (2006). argue a theoretical framework offers “suppositions that inform the phenomenon under study and comes from existing scholarly literature” (p. 22). Also referred to as a theoretical lens, a theoretical framework informs how data are collected and

analyzed, and it provides a call for action or change (Creswell, 2009). Theoretical perspectives, or a researcher's worldview, influences how the researcher will approach and design the study, as well as how they will approach the topic in more abstract terms (Jones et al., 2006). As it would therefore have implications for how one would embark upon a study, including how data are collected and analyzed, it is important for the researcher to understand and articulate their worldview. Constructivism, from an epistemological standpoint, describes the assumptions of knowledge in which the researcher holds. From a constructivist's point of view, understanding of this world is "inevitably our construction, rather than purely objective perceptions of reality, and no such construction can claim absolute truth" (Maxwell, 2012, p.43). As described by Jones et al. (2006), knowledge, from a constructivist perspective, is co-created with participants, and while constructivist perspectives are not critical in nature, they bring to the forefront of analysis the voices, experiences, and meaning making of participants. To understand what it means to be an IT professional in higher education, this meaning will need to be co-created with participants whose past experiences may all be very different from one another.

Another important aspect to consider is the meaning that IT professionals and university stakeholders create and hold in regards to the various educational technologies and their uses. In Pinch and Bijker's (1984) seminal study, these two social constructivists posit that technical innovations are constructed and interpreted socially, and the meaning attached to these innovations may vary depending on the social group in which the technology is applied. Their theory and framework, the Social Construction of Technology (SCOT) was founded on four major concepts, with a fifth added later by Bijker (1995). The first is the concept of interpretive flexibility, which suggested that technology design is an open process that can produce different outcomes depending on the social circumstances (Klein & Kleinman, 2002). For example, if an

institution was implementing a real-time collaboration solution, this technology would be viewed differently by administrative staff than by faculty and students, or even IT professionals. Administrative staff might only be concerned with the ability to share screens and visually see participants, and only during traditional business hours. Faculty and students may view this technology as critical during all hours of the day, especially with students spanning multiple time zones, and may have additional needs for break-out rooms and learning management system integration. IT staff may have yet additional views surrounding the ease of management, integration capabilities such as single sign-on, and how to secure communications. The second concept in this framework is relevant social groups. Development of a given technology will continue until a consensus is met by all relevant groups on how the artifact works. Continuing the previous example, an institution might continue to develop or evaluate solutions until all three of these groups agree that their respective needs have been addressed. Third is closure and stabilization. Design work on a given technology will continue until conflicts are resolved in such a way that that they no longer pose a problem to the relevant social groups (Klein & Kleinman, 2002). This could be viewed as "bugs" in the technology that need to be fixed or properly mitigated. The fourth is wider context, or how to relate the content of a technological artifact to the wider sociopolitical milieu (Pinch & Pijker, 1984), though little more is mentioned in the original article on this concept. The fifth concept added by Bijker (1995) was that of the technological frame, which is the shared cognitive frame that defines a relevant social group and constitutes members' common interpretation of an artifact (Klein & Kleinman, 2002).

While the SCOT framework is focused more on the development or innovation of technological artifacts, the overarching theory of technology being socially constructed and interpreted aligns well with the constructive perspective of this author and this study. In many

ways, technology is one of the core aspects of an IT professional, as without technology, there would be no need for technology experts and the services they provide. The meaning, interpretation, and value of a given technology may be vastly different depending on the group utilizing or depending upon the technology. The meaning that administrators place on the student information system of a university may be vastly different than the meaning students place on the same technology. This shared meaning will be important in understanding the essence of being an IT professional working in higher education. The shared meaning created and held by IT professionals for the technologies in which they support, the shared meaning created and held by students and instructors for those technologies, and how those different meanings might impact the work of IT professionals in higher education will be important to understand.

Understanding the essence of being an IT professional in higher education depends upon examining the feelings, biases, and attitudes of the participants to find commonalities among the experiences and perceptions and the meaning each ascribe to this phenomenon. Utilizing a phenomenological approach, which will be discussed further in the following section, along with the lens of SCOT for collecting and analyzing data in conjunction with the conceptual model from Chapter II will help ensure the discovered themes and meanings accurately reflect those of the participants and the essence of being an IT professional in higher education can be fully understood.

Research Design

Qualitative researchers are interested in understanding how people interpret their experiences, how they construct their worlds, and what meaning they attribute to their experiences (Merriam & Tisdell, 2015). Qualitative research is a situated activity, typically undertaken in the natural settings of the phenomena and involves an interpretive, naturalistic

approach (Denzin & Lincoln, 2005). A variety of empirical materials are typically collected and studied, such as personal experiences, life stories, cultural texts, interviews, observations, and visual images (Denzin & Lincoln, 2005). Analysis is conducted by extracting themes of generalizations from collected data and organizing to present a coherent, consistent picture (Nueman, 2014). This study was qualitative in nature, as it seeked to understand the experiences of IT professionals in higher education as shared by the people in this group, and the meaning in which these people attribute to those experiences. It consisted of document analysis and in-depth interviews, providing a means for understanding the essence of being an IT professional in higher education.

A Phenomenological Approach

Phenomenological studies seek to discover the nature or essence of the experience shared among the participants (Jones et al., 2006) and then describes the common meaning of these experiences (Creswell, 2013). Phenomenological research examines the feelings, biases, and attitudes and seeks to uncover commonalities among participants' experiences and perceptions (Simon, 2006). To do phenomenological research means to get at the essence of a particular phenomenon among a typically small group of individuals who have experienced the phenomenon (Jones et al., 2006; Creswell, 2013). As the purpose of this research was to discover the essence of what it means to be an IT professional in higher education, a group in which little literature exists, this is was an appropriate approach to utilize for this study. A phenomenological approach allows for deep insight into the experiences of those who have shared in the phenomenon of working in higher education as an IT professional. This approach lends itself well in understanding each participant's experience and perceptions and uncovering the commonalities among them, which is why this approach was chosen for this study.

Utilizing this approach might cause some dissonance for one that holds a constructivist viewpoint, however, as phenomenology stems from positivism (Sinha, 1963). There are researchers that have attempted to rectify this dissonance, highlighting the possibilities for those that hold constructionist worldviews to successfully conduct phenomenological research. Apelgren (2003) considered the similarities in the ways in which proponents of personal construct psychology and phenomenology view reality in an effort to "bring forward the range of possibilities that are open for researchers within the Constructivist paradigm" (p.132). Apelgren (2003) suggested that these views suggest a non-dualistic perspective, which is "in sharp contrast to the positivist paradigm, which puts faith in external objective reality made up of facts which can be explored, measured, and observed for what they really are a dualist perspective" (p.133). Seigfried (1976) argued that phenomena which phenomenology describes are "by their very nature constructions, and that phenomenology itself is nothing but a method modeled on that of sciences and designed to finally turn philosophy into a strict science after centuries of random speculation" (P. 248). Vagle and Hofsess (2016) argued that participants are both "agent and acted upon – what is available for that subject is both a manifestation of the social and is made possible by that subject's intending" (p. 337).

Phenomenological studies typically involve the use of interviews with open-ended questions, allowing participants to describe their experience and the meanings they make (Jones et al., 2006). These in-depth interactions between the researcher and participant provide excellent opportunities for reflection on the phenomenon, and allow the researcher to discover the essence of such. This approach aligns well with this study, as it will provide opportunities to construct meaning with the participants. On the other hand, this perspective can create an inherent tension in a phenomenological study between what is known from previous research and what is

constructed through new interactions (Creswell, 2013). Along these same lines, qualitative researchers using a phenomenological approach must also attempt to set aside their personal experiences and assumptions to take a fresh perspective of the phenomenon (Creswell, 2013, Jones et al. 2006), a concept known as epoché, or bracketing. This was constantly considered during this research, as a researcher who identifies as a seasoned IT professional having worked many years in higher education. This was accomplished through the use of memoing, the use of a peer debreifer, and revisiting the data several times throughout data analysis.

Sample and Study Instrumentation

This study explored the essence of being an IT professional working in higher education. The population for this study consisted of information technology professionals currently employed directory by four-year degree-granting institutions' office of information technology located in the state of Michigan. The sample consisted of IT professionals who have worked for a college or university in Michigan for at least the past two years in a full-time capacity. Participant selection is dictated not by the method, but by the phenomenon (Hycner, 1985). The participants for this study were chosen using a purposive method, rather than probability. Purposive sampling uses the researcher's knowledge and experience of the group to be sampled to assist in selecting appropriate individuals (Lunenburg & Irby, 2008). Criterion sampling is a type of purposive sampling often used in phenomenological studies as participants are selected who have experienced the phenomenon of interest (Collingridge & Gantt, 2008). As stated by Creswell (2013), criterion sampling is an appropriate choice when all individuals studied represent people who have experienced the phenomenon. As this study focused on the experiences of IT professionals who currently work in higher education, this was an appropriate sampling approach. To be considered for this study, participants needed to hold a role that is

directly responsible for the installation, maintenance, security, or development of hardware or software necessary to the core infrastructure in which critical business functions of the institution rely. This included, but was not limited to, an institution's LMS, SIS, FIS, as well as those working in an institution's networking, software development, security, and business intelligence areas. It was also necessary for participants to be directly employed by the institution and not working through a third-party entity. Initial participants fitting the criteria were solicited utilizing existing contacts made from prior events, such as national conventions and local user group conferences. Prior to reaching out to participants, verification was done utilizing institutional websites to verity that the institutions in which the individuals were employed met the necessary criteria and that the participants' job titles or descriptions aligned with requirements set forth in this study.

Participants

Initial emails were sent to existing contacts using the template approved by the researcher's Institutional Review Board. Following acceptance from participants, approved consent forms were provided to participants through a follow-up email prior to negotiating interview times. In two cases, participants were met during conferences, in which case the consent form was sent through email after verbal acceptance of participation. Snowball sampling was utilized to solicit additional participants. Snowball sampling uses the knowledge of participants who can identify other potential participants that fit the sample qualifications, who would then in turn provide other potential participants, and so on (Lunenburg & Irby, 2008). Given that the selected IT professionals may know of other willing and qualified individuals from both their own and other universities, this strategy worked well in finding additional potential participants. Once the list of potential participants from the snowball sampling were

exhausted, additional research was conducted using institutional and departmental websites to identify additional participants meeting the criteria of the study. Emails were sent to those whose job titles or descriptions fit the criteria for participation, starting with those working in institutions that were unique to the participants who had already been interviewed. This process continued until data saturation had been reached, which is the point when the collection of new data does not shed any further light on the issue under investigation (Glaser & Strauss, 1967).

Data Collection Procedures

The goal of a phenomenological study is to understand the lived experiences of the participants, which requires offering meaning beyond what is stated by participants (Creswell, 2013). Both Creswell (2013) and Jones et al. (2006) recommended the use of in-depth interviews as a method to gather the essence of participant lived experiences. For this study, a semi-structured interview protocol (see Appendix E) was used for all participants. During these in-depth interviews, open-ended questions were asked to allow experiences to be shared and to allow for follow-up questions to be asked by the researcher. To be as accommodating and as minimally disruptive as possible towards the participants and their respective organizations, interviews were offered in both a traditional, face-to-face method (same physical location) or a virtual, face-to-face method (same virtual location). Only one participant opted to meet in the same physical location. This participant was asked to choose the location for the interview, to which they elected to meet at a public place in the city in which the participant lived and at a time outside of traditional work hours. The other participants all elected to meet virtually. The meetings were conducted using the tools in which the participants were most comfortable or would require the least amount of effort to connect. One elected to use Cisco WebEx, and the rest elected to use their personal Microsoft Skype accounts. All but one of the virtual meetings

took place with the participants connecting from their home. The last elected to connect from their work office after hours, as they believed it would allow for a more private conversation.

Interviews with the seven participants lasted approximately one hour in length, with a few reaching closer to an hour and a half. This provided ample time to allow participants to elaborate as much as they felt necessary on the questions and provided enough time to ask any follow-up questions. While participants were asked to consent to having the interviews recording with the informed consent form prior the interview, all participants were verbally asked again if they consent to having the discussion recorded to provide another chance for them to reconsider the request. The recordings allowed the researcher to be more engaged in the conversation, as well as to record personal memos throughout the discussion for assistance during the analysis process.

Additional documents were collected and analyzed in addition to the interview data. Information related to their current and past work history and experiences were collected through the use of public and social media sites, along with the participants' institutional websites. These were not only helpful in identifying potential participants, but allowed for additional insight into the participants' skills, education, and experience, and allowed for additional verification of what was shared during the interview. The university and organizational mission statements were also collected and analyzed to assist in revealing the culture and values of the institution from the perspective of the university leaders, which were then used to compare with the responses of the participants to help validate was discovered through the interview process, and in turn, provide additional insights into the essence of being an IT professional in higher education.

Consideration of Human Subjects

As this study involved interviewing human subjects, the list of questions and data collection procedures were submitted to the Institutional Review Board for approval prior to any research being conducted. Participants were provided and asked to sign an informed consent form (see Appendix F) prior to being interviewed. This was sent in advance to allow participants time to consume the information and reconsider if they so choose, as well as save time during the allotted interview time. For participants electing to meet virtually, they were asked to return a digital copy to the researcher prior to the agreed upon meeting time.

All data were collected and handled with the utmost confidentiality to allow for the open and honest responses of the participants and to avoid any recourse once the results of the study are released. Data collected was stored using strong encryption to ensure the confidentiality and integrity of the data, utilizing 256-bit AES encryption algorithms. This included the use of full-disk encryption on any laptop or desktop used to store or analyze collected data. Upon completion of the dissertation process, all files containing raw data, both physical and digital, will be destroyed in order to maintain participant confidentiality.

Data Analysis Procedure

Analysis involves the way in which a researcher differentiates and combines data that has been collected and the reflections in which are made about the information (Miles & Huberman, 1994). This qualitative study utilized Moustakas' (1994) suggested methods for analyzing data in phenomenological research, which include horizontalization, or the analysis of significant statements, the generation of meaning units, and the development of an essence description, as well as Glaser's (1965) constant comparative method for use during the coding process.

Before analysis of significant statements can happen, all recorded interviews must first be transcribed. This was done with the assistance of third party transcription services as a means of both quality and resource control. Third party consideration consisted in part of well-established reviews, privacy policies, and the use of encryption technology for the transmission of any data to ensure both data integrity and confidentiality. Once the recordings had been completely transcribed, they were analyzed for significant statements. Jones et al. (2006) referred to this as open coding, in which the researcher puts aside preconceived notions about what he or she expects to find**.** Codes are tags or labels for assigning units of meaning to the descriptive or inferential information complied during a study, and are usually attached to pieces of words, phrases, sentences or paragraphs (Miles & Huberman, 1994). During the open coding process, Glaser's (1965) constant comparative method was utilized, to which each code was compared with the previous incidents coded in the same category. Once the open coding has been completed, the discovered codes were grouped into meaning units, also referred to as themes or categories. This process is referred to as axial coding, consisting of intense analysis done around one category at a time, resulting in knowledge about the relationships between categories (Strauss, 1987). The open and axial coding process was assisted through the use of the qualitative analysis software, NVivo.

Once the open and axial coding had been completed, an essence description should be developed, which begins with a textural description of the experience (Moustakas, 1994). This textural description should include the details of "what" each participant experienced. Once this has been completed, the structural description will be written, which includes the setting and context in which the phenomenon was experienced (Creswell, 2013). Finally, a composite description was written which incorporates both the textural and structural descriptions,

representing the essence of the participant experience, providing the reader a strong sense of what it is like to be an IT professional in higher education in the state of Michigan. Throughout the coding and analysis processes, the researcher utilized the conceptual model and the theory of social construction of technology as a lens in which to consider the collected data and how they relate to essence of being an IT professional in higher education.

Role of the Researcher

Having worked as an IT professional in education for nearly two decades, with one of those decades being in higher education, I brought my own personal experiences and values to the process. This assisted in the creation of the research instruments for data collection as well as the interpretation of those data. I believe it also helped in building the confidence and trust of those willing to participate in the study, allowing them to be more open in his or her responses, and allowing them to speak in a more technical manner. My personal experiences of being an IT professional provided a great understanding of the pressures often applied to those in the field, which helped to ensure the obligations of the participants in regards to this study were minimalized. As the researcher of this study, I occupied the role of participant observer, interacting with, and getting to know the participants who were willing to speak with me. Researchers should remain cognizant of the impact they have on the work environment of the participants and should attempt to minimize disruptions (Creswell, 2009). This was accomplished by allowing each participant to choose the time and location for the interviews, ensuring that enough privacy was provided to allow for open and honest responses, and to not interfere with work obligations or disrupt coworkers.

Validity, Reliability, and Trustworthiness

In qualitative research, validity does not carry the same connotations as in quantitative research (Creswell, 2009). Creswell (2013) described validation in qualitative research to be an attempt to assess the accuracy of the findings as best described by the researcher and the participants. As such, there were many strategies utilized to enhance the trustworthiness of this study. Member checking involves soliciting the participants' views on the findings and interpretations of the information gathered from interviews. By providing an opportunity for feedback, this allows participants to judge the accuracy and credibility of the accounts of this study (Creswell, 2013). A transcription of the interview was sent to each participant to allow them the opportunity to validate what was shared, and to provide an opportunity to either redact anything that was said, or to elaborate on anything shared after having time to reflect upon the interview.

Triangulation is another method of increasing the trustworthiness of a qualitative study. This involves using different data sources of information to corroborate the discovered themes (Creswell, 2013). Although not always necessary for a phenomenological study as it is the participants' articulation of their experiences that really matter (Jones et al., 2006), triangulating the information from participant interviews, literature review, participant job descriptions and history, and organizational mission statements will strengthen the trustworthiness of this study. This study also utilized qualitative data analysis software, which assists with data accuracy by confirming that a number of participants held the same opinions or experiences and ensuring dependability of the study (Houghton, Casey, Shaw, & Murphy, 2013). Another method to ensure dependability is through the use of peer debriefing, where a peer familiar with the research reviews and asks questions of the methods and findings. The researcher involved a

trusted peer who would qualify as a participant, but was not included, in an effort to ensure the reliability of the identified codes and as a check against the researcher's personal biases. Finally, along with a comprehensive review of literature, providing rich, thick descriptions will allow readers to make decisions on transferability (Creswell, 2013) and will further enhance trustworthiness of this study.

A qualitative researcher needs to be conscious of their biases, values, and experiences they bring to a qualitative research study (Creswell, 2013). Creswell (2013) described this reflexivity as having two parts: The researcher discloses his or her experiences with the phenomenon, and then discusses how these past experiences shape the interpretation of the phenomenon. To assist with this, I had a trusted peer interview me using the same interview protocol, to allow me to reflect upon my own views of being an IT professional working in higher education. I maintained consciousness of these experiences and biases throughout the research and bracketed myself while collecting, analyzing, and interpreting data from participants. I also utilized personal memos (Jones et al., 2006), which is recommended in phenomenology (Grenewald, 2004) to document my own thoughts and decisions throughout the process to aid in the data analysis, helping to increase the trustworthiness of the study.

Perceived Problems in Data Collection

As with any qualitative study, there were ethical concerns that needed to be addressed throughout the process. As stated by Jones et al. (2006), all research decisions must be evaluated against the likelihood of avoiding harm and doing good. Extreme care was taking before any interviews were conducted to ensure that participants understood the purpose of the study and were fully aware of any risks associated with sharing their experiences.

During data collection, ethical issues may emerge due to the way in which data are collected, where data are collected, and why data are collected (Jones et al., 2006). Participants might disclose information about their attitudes towards their job, peers, supervisors, or the institution that may have negative ramifications should the information be overheard. This was mitigated by allowing the participants to choose the time, location, and method of communication. Whenever participants hesitated or made statements to the fact that they probably shouldn't comment on a particular topic, they were reminded that anything shared would be held in the strictest of confidentialities and that anything that is published will be anonymized to ensure the anonymity of the participant and his or her institution. Presentation of the findings was crafted in such a way to protect the identities of the participants, while still providing a rich, thick description of the participants' stories to the readers.

Time Line

All approvals required by the Institutional Review Board and the Office of Research and Graduate studies were completed by the middle of April, 2017. Participant solicitation began at the end of April of 2017, with approved consent forms available at that time. Interviews and data collection were conducted from the beginning of May through the middle of July of 2017. Transcription of data was completed by the end of July, with the analysis completed by September of 2017. The goal of the researcher was to have the study completed and submitted for review by the dissertation committee by November of 2017.

Summary

Chapter III provided an overview of the methodology of the proposed study, which was to explore the essence of being an IT professional working in higher education. The proposed study was qualitative in nature, utilizing a phenomenological approach. The theoretical

perspective of the researcher was discussed, followed by a description of the theoretical framework that as used to guide the study. Study population and sample were detailed, as well as the instrumentation that will was used for data collection. Data collection procedures were detailed, as well as the importance of reliability and validity. Finally, a time line of the study was provided. Chapter IV will present the findings of the study, and Chapter V concludes with a summary, discussion, and recommendations for future research.

CHAPTER IV

RESULTS

Introduction

As the number and complexity of new technologies that faculty, students, and staff depend upon increase across the campus, so do the responsibilities and challenges of the IT professionals tasked with their operation and support. A group of people that are absolutely critical to the success of the organization, but one that is often misunderstood, underutilized, and underappreciated. IT professionals spend an extraordinary amount of time monitoring critical resources to ensure the confidentiality, integrity, and availability of the system on which faculty, staff, and students rely. While much research exists on the various technologies used in higher education to improve operational efficiency and student learning, little research exists on how the use of technology in this regard impact IT professionals, or how the decisions around the use of these technologies to gain efficiencies for institutions might impact the people and culture of IT. The purpose of this phenomenological study was to explore the essence of being an IT professional working in higher education. The focus of this study was to gain an understanding of the technical and cultural needs of IT professionals working in higher education. A phenomenological approach was used to allow deep insight into the experiences of those who have shared in the phenomenon of working in higher education as an IT professional. The research question for this phenomenological study was: What is the essence of being an IT professional working in higher education? The purpose of this chapter is to provide the findings, which includes an overview of the participants and the five themes that emerged during data analysis.

Participants

The study included seven participants from six different four-year institutions in the state of Michigan. A total of 45 participants were solicited from 20 different institutions, with the ones willing to participate appearing eager to share their stories. The other 38 potential participants either provided no response, or responded that they were too busy to participate. While no participant offered his or her actual age, the length of time each has spent working as an IT Professional was given and ranged from five years to 27 years of full-time experience. Job titles for participants included: Network Engineer, Web Software Developer, Web Systems Developer, System Administrator, System Developer, Software Developer, and Windows Systems Administrator. Three of the participants hold Bachelor's degrees, two hold Master's degrees, one holds an Associate's degree and is currently working on a Bachelor's degree, and one has no formal education. Of the institutions in which the participants are employed, two are public institutions with student enrollments between 8,000 and 10,000, and four are private institutions with student enrollments ranging from approximately 2,300 to 23,000.

Table 1. Participants

	Job Title	Years of Experience	Level of Education	Institution
Bobby	System Administrator	10	Masters degree	Private
Kris	Web Software Developer	7	Masters degree	Public
Jamie	System Developer	8	Bachelors degree	Private
Casey	Windows Systems Administrator	3	Associates degree	Private
Sam	Web Systems Developer	27	Bachelors degree	Private
Alex	Network Engineer	10	No formal education	Public
Taylor	Software Developer	20	Bachelors degree	Private

Interviews

For this study, a semi-structured interview protocol (see Appendix E) was used for all participants. During these in-depth interviews, open-ended questions were asked to allow experiences to be shared and to allow for follow-up questions to be asked by the researcher. Questions were developed using the conceptual model from Chapter II and were designed to allow participants to reflect upon the areas that come together to provide insight into the essence of being an IT professional in higher education. Participants were asked to consider their background, their technical skills, what motivates and de-motivates them, as well as cultural aspects of the IT organization, as well as the institution as a whole. Participants were also asked to consider their work's impact on the different university constituencies in regards to student learning and operational effectiveness. Interviews lasted approximately one hour in length, with a few reaching closer to an hour and a half. This provided ample time to allow participants to elaborate as much as they felt necessary on the questions and provided enough time to ask any follow-up questions.

Findings

A total of 39 codes were created from the data analysis, in which five themes emerged: It's Who I Am: The Ascribed Importance of Identifying as an IT Professional; That's Not Me: Being Stereotyped as an IT Professional; It's What I do: The Impact of the Work Performed by IT Professionals; My Work Environment: The Structure and Culture of the IT Professionals' Work Environment; Choosing Higher Education IT: The Benefits and Drawbacks to Working in Higher Education as an IT Professional. The first theme, It's Who I Am: The Ascribed Importance of Identifying as an IT Professional, participants shared about their hobbies, motivation, strengths, weaknesses, and the ways in which they communicate. The second theme

was That's Not Me: Being Stereotyped as an IT Professional, where participants shared their thoughts and perceptions about being stereotyped and the external perceptions others have of IT professionals and the field of information technology. The third theme was It's What I Do: The Impact of the Work Performed by IT Professionals, in which participants shared about the work they perform and the impacts that work have on the various institutional stakeholders. Theme four was My Work Environment: The Structure and Culture of the IT Professionals' Work Environment, where participants shared about the work environment and the culture of both the institution and the department in which they work. Theme five was Choosing Higher Education IT: The Benefits and Drawbacks to Working in Higher Education as an IT Professional, where participants shared the benefits of working in both information technology as well as in higher education. The remaining sections of Chapter IV will provide the findings each of the five themes, including narratives from each. To help ensure anonymity, each participant was given a pseudonym, which helps allow them to speak more freely and openly about themselves and their respective institutions.

It's Who I Am: The Ascribed Importance of Identifying as an IT Professional

The participants all shared descriptions, anecdotes, and stories that help to define who they are as IT Professionals. These included various self-reflections upon areas such as individual strengths, weaknesses, the way in which they communicate with others, factors that both motivate and de-motive them, and other personal attributes. Combined, these help to describe the way in which IT Professionals working in higher education view themselves and how that might impact they work they perform.

Information Technology is a broad field, and as such, the skills possessed by those in the field may vary greatly between roles. Each of the participants were open as to his or her strengths

and weaknesses, highlighting both the overlapping skill sets across the various roles, as well as the uniqueness of those based on the roles in which they play in the field. Bobby, a System Administrator with over a decade of experience, acknowledged the varying skill sets among different roles, and shared their greatest strengths and weaknesses in their current role:

> Again, this can fluctuate depending on your experience in the industry that you're in because there's no cookie cutter template that you're going to walk out of college with that says you're going to be able to fit in x, y, and z. If you're a strong programmer, you're always going to have a spot regardless of the industry, I believe. I'd say my true skillset at this stage, outside of having a firm grasp on the technical world, because most of us in this position have the years of growing up and being able to be that person that can fix problems, is just really understanding and communicating with others that are across various levels of knowledge when it comes to the technical world. I think that's a true skill that not a lot of people have. Being able to relate to the techies and the non-techies in an efficient way and getting everybody on the same page. I would say that I'm probably weakest when it comes to truly coding a solution, but that doesn't mean I can't get the job done. That just means that there's people that are much more well-versed and better at it than me. I can get the job done, but I'll never be the shining star that can fix everybody's problems via command line. That's probably where I'm at right now.

Kris, who works as a Web Software Developer with seven years of experience, shared their strengths of working with various other IT groups, but acknowledged their shortcomings with attempting to stay current:

> I'm good with working with other people, other groups, stuff like that. System administrators, I usually work with them the most just because of the amount of servers

> our three man team maintains. I usually work pretty good with groups as far as hashing out younger developers' ideas. They might go real gung-ho on something and not think of how is this going to affect our campus in six months from now. The kind of guy I am, usually what I do these days is I really take a hands-off approach to our development. Sometimes, I'll admit, with new technology I get frustrated trying to stay up with the latest and greatest with web trends. I would say that is a weakness, mainly the frustration I sometimes get. Sometimes new technology gets me when I get set in my ways.

Jamie, a System Developer who has been at his institution for over eight years, spoke about their ability to quickly adapt to new technology being one of their best skills:

> I think one of my largest ones is my adaptability. Even if I don't have any knowledge of the system I usually am able to adapt to very quickly to working with it. Such as last year, they wanted to move who was actually in charge of our ID card system and doing the printing and things like that, so they said "Well, we'll just give it to Jamie because he is going to be able to make this more automated and make it easier on the users." And so sure enough, within three months, I had already re-did all the cards and changed the processes and made sure all the instructions are there, so that when the people needed to do any of the cards or anything like that, it made it a lot easier. And everybody in the process has been much happier with the way that it is designed now compared to what it was before.

When reflecting on weaknesses, Jamie shared how their perfectionist tendencies can slow down work progress:

> I mean part of it is that I'm always trying to be a bit of a perfectionist on things, and with that, it does drag down the amount of time it takes to do certain processes. Part of that

> want of perfection is making sure that whatever we try to design, we're trying to design it in a manner that it's making as many people happy as possible.

Casey, a Windows Systems Administrator who has been an IT professional for three years, believes that their troubleshooting and researching abilities are their greatest strength:

> Troubleshooting, I guess. That's kind of important for anyone in this field. Beyond that, maybe research, I guess. There's been times that we start working with a new vendor, some new technology where there's not really a wealth of knowledge out in the forums or a knowledge base and their support actually kind of sucks because they're a new company. You just kind of have to blaze your own trail and figure out how it works. Sometimes you end up knowing more about it than their support reps do just because you have to make it work.

When discussing weaknesses, Casey was very open about their struggle with the various social aspects of the job:

> Probably weak on some of the social aspects. Not as bad as I used to be and definitely not as bad as some of the other people I work with, but there's a lot of times where just soft skill issues or social issues or political issues get in the way. I just want to deal with the technical problem. I just want to dive in and fix it. I want to write a script or something to fix it and the politics are kind of exhausting and something I'm not particularly good at, so that's definitely a weak point, but I think that's a problem with a lot of IT people. They tend to be kind of introverted.

Neither Sam nor Alex spent much time elaborating on their strengths or weaknesses. Sam, a Web Systems Developer with over 27 years of experience stated that "I feel like I have the ability to troubleshoot, you know. Logical problem solving, things like that. I'm trying to get more creative

in my web development, but that's not really my strong suit." They also cut right to the point with their weaknesses: "Well, documentation, or course, is not a strong point of mine." Alex, a Network Engineer with over a decade of experience, shared that he is pigeonholed into networking, which is his greatest strength, and that working on desktop PCs is not something he has spent a lot of time doing and rely on others to take care of that area.

Taylor, a Software Developer with over 20 years of experience, shared their desire to constantly learn and master new things, and often put too much pressure on themselves for things learning things outside of their domain:

> The more I'm taking on now, it's just throwing me to the fact of, oh, I got to learn this and this. It gets a tad scary, but yet the fact is you just want to continue to learn and continue to go. That's always been one of my features as I've always wanted to learn the unknown and I just don't go to the point of it being, okay, I'm done with that. Move on. I'd dig deeper. I want to learn. The commitment continues to grow. I don't become bored with things when it comes to this because there's always something new to learn. I'd say probably that would be my best asset, always wanting to learn, challenging myself, over-achiever. That describes me. You feel so confident in your job that you know exactly what you're doing and you can explain it to people. You could step by step or high level, whatever you need to do. When you're taking on something new, a total different area than what your expertise is at, I freak to the point of what I'm expecting of myself. I put too much pressure on myself to know it when I really have no need to, or to that point have known anything about it.

Extracurricular. Along with their strengths and weaknesses, many of the participants shared that technology is just part of their life and ingrained in what they do, but that it does not completely encompass their personal lives. Bobby articulated the former well:

> It's hard to make the distinction between hobbies and just what's part of my life. I mean technology is fully vested in everything that I do it seems, whether it's reading the news on a given device or staying up to date, whether it's in the field of technology or if it's world events, things of that nature, reaching out to relatives that live across the country. I enjoy being engaged with technology.

Kris shared numerous activities they enjoyed outside of work that are technology-related:

> I like technology, I've always been into it. At home I was always a PC gamer kind of guy, I still do consulting on the side. I have my own LLC. I do the county chamber of commerce's website. I do a couple small business' websites. It's more of a referral thing, I really don't go out looking for the work because I usually stay pretty busy. It's just something to make a little extra money on the side.

Similarly, Sam spoke about collecting vintage Macintosh computers and helping others clean up their slowly-performing machines:

> I have a Macintosh collection. I have an original Mac Plus. I had the opportunity now to get a couple of Apple IIe's and I'm going to get those and try to resurrect those. I have a pretty good ability to do Windows or Mac computers. I can resurrect them and take care of viruses, I can clean those up. I do have a fair stream of people whose computers are so overwhelmed that they can't use them anymore, and so far, I've been able to resurrect them all. Clean them up and give them back to them. It's not a business or anything, just a personal challenge to clean them up and get them back up and running again.

Casey spoke about getting into virtual reality for gaming and tinkering with technology-related things, such as having multiple rack-mounted servers in their basement, but also shared about needing a break after hours:

> I still game, but obviously not as much now that I have a full-time job. It's not as easy to find time. I'm sure you're aware. You get home after eight, nine hours, sometimes you just want to sit here there and zone out instead of doing something stressful like playing a game, which if it's multiplayer it's stressful.

Jamie also described a need to disconnect:

> I'm so spread out at work, that when I get home I actually try to stay away from it because I try to stay a lot more active doing sports and things like that. Because when I'm at work, I mean, I get so into everything, so regardless of whether it's something I work with or somebody else works with, I'm always trying to research, always trying to help people there, that when you get out of work you just don't want to get into it anymore.

As did Taylor:

> I find it hard at times to walk away from the commitment that I had given my career. I enjoy working on it but sometimes when I'm bored, I have a tendency of picking up my computer and signing on and doing work. As in hobbies, not so much. Maybe earlier in the career, yes, but now that I've gotten older, I've finally figured out that it's okay to give work a dedicated amount of your time but you still have to enjoy life. I guess I'm finally at the point of enjoying life. Sometimes it's more important than all the other extra hobbies and work that I do outside my hours.

Technology is just part of the participants' lives and is ingrained in what they do, but it does not completely encompass their personal lives. Many participants enjoy both technology-

related hobbies, such as PC gaming, creating websites for small businesses, and collecting vintage Macintosh computers, as well as non-technology-related hobbies, such as playing sports, or simply disconnecting from technology all together. In other words, it is not always about technology.

Communication. The ways in which one communicates is an essential part of one's self. The participants were all asked to consider the way in which they prefer to communicate, and they seemed to understand the reasons behind their preferences. While the ways in which communication takes place vary among the participants, each expressed how critically important the role of communication plays in providing great service. Some through the physical interaction and getting to know his or her constituents, and others through the documentation of conversations to expedite future troubleshooting and assistance. Jamie shared:

> We do communicate through email. We do communicate through instant messaging. I prefer face-to-face. I just find that a lot easier to actually get a true back and forth of information. Being able to point at something on the screen or whatever and actually show them that, "oh yeah, this is what I'm referring to, and then we do this, this, and this with it."

Sam shared, "I would prefer face-to-face, but I'm also open to instant messaging. We do have Skype for Business, which I used to use as Lync, and I think that's a very helpful tool. You can get answers immediately." Alex and Taylor both expressed their preference toward speaking directly with people, stating that, "Some people like text or Skype. Some people will just email. That's not necessarily a universal communication method for everyone in our department. I like calling them or stopping by their office." and "The best way is most of us still prefer talking in person and stuff, versus email or anything else. We usually IM them to see if they're there. If

they're there, we'll go talk to them or just walk down the hallway to see." respectively. Bobby also shared this sentiment:

> We interact via IM, via texting, or via phone calls, or just yelling to each other via the hallway. IM seems like it's the easiest. It depends on who I'm communicating with, but with my guys, IM and email is just fine. But if it's outside of my specific department, I still prefer fact-to-face just because, again, I think communication is so critically important, so understated when it comes to the IT folks and non-IT folks. When I deal with the academic folks, I would like to talk to them in person, that way I can truly understand and gauge what's important. What they are trying to get to. If there's things that I can do to add to the conversation.

Kris and Casey both discussed their preference to document conversations. Kris spoke about digital workspaces, like Slack, which allow groups of people to organize conversations around topics and provides means for both asynchronous and synchronous communication: "We use Slack. Nobody really uses email anymore. Some people still use Skype, but most of us jump on Slack. Slack is the preferred means of communication anymore with our department." Kris also discussed communicating with those outside of their department, stating that, "Usually, 99 percent of the time it's email. That way we have a history trail of requests with them." Casey shared:

> I like email a lot. Even if they happen to be right next to me. If I need some information from them, rather than walk over or shout over the cubicle wall, I might just send them an email even if they are sitting three feet away from me, because I want it in writing back, so in a month from now when I can't remember any of that same info, I can go search for

> that email rather than having to ask again or write it down or make sure there is a document somewhere. Something electronic anyways, so I can reference it later.

All the participants use a variety of methods to communicate with the various stakeholders, including email, instant messaging, Slack, telephone, or simply walking over and speaking with someone in person. Each participant expressed their preference, which might vary based upon those to whom they are speaking. Many participants stated that they prefer a technology-based method for communicating with their peers, but preferred face-to-face conversations with those outside of their department.

Motivation. To continue with the self-reflection, participants were asked to think about the different aspects of their work that they find to be motivating as well as those they find de-motivating. Many of the participants hesitated when considering motivating and de-motivating aspects of their work, with a few admitting that they have never had to consider this before. Though upon considering for a short period of time, all were able to identify factors they found both motivating and un-motivating, including factors such as problem solving, implementing new things, helping people use technology, being blamed for things outside of their control, and working with people unwilling to change. Bobby shared that they really enjoyed the challenge of solving problems and feeling like they are contributing to the organization:

> It's nice to be motivated. To feel like you're solving problems and you're allowing your users to go about a service that they pay for. I think that's motivating. I think that individual motivation is always going to be so across the board depending on who you talk to. I mean some person might be motivated by just the paycheck. Some person might be motivated by the part they play in the cog in the whole. For me personally, I'm motivated by, that's actually a tougher question that maybe more people should ask

themselves, but motivation, to me, is being a contributing factor into the overall success of the organization.

Bobby continued with:

> I don't mind being on-call 24/7. I don't mind having to put out the fires when they arise. It's just more of maybe the stigma that's attached to them all because it just seems like, "Oh well you know it's IT's fault because x, y, and z happened," when maybe some factors are out of your control or maybe they could've been solved but for one reason or another they weren't.

Casey shared a similar sentiment:

> Attacking a problem algorithmically, I enjoy doing that. Maybe I'm working on this big 500 line PowerShell script to do something and I might remote in after work, but I'm not even on the clock and work on it just because that's the kind of thing that excites me and I like to do. Maybe I'll be lying in bed at nine o'clock and I'll have an idea. I'll open up my laptop and write it down to make sure I don't forget.

When asked about de-motivating aspects of their position, Casey stated that they didn’t care much for the political and interpersonal side of their job, but also that they feel frustrated when micromanaged over the little things from those at higher levels. They shared a story to help convey their frustration:

> We rolled out, about a year ago, two new computer labs that are all thin clients. So, they all just connect to my Citrix infrastructure. They're not physical lab machines like most of my labs were at the time. That's the kind of stuff the president takes a personal interest in because it's almost a PR campaign as well as a technical thing, and then he's breathing down your neck about stuff. And maybe he doesn't like that these old thin client models

> use a legacy storefront interface when these new ones use the regular web interface, and he doesn't like that they look slightly different when they're in the same lab together. I just hate having to deal with that crap. I get up in the morning and you drag your feet a little bit because I'll have the president breathing down my neck all day today.

Kris talked about the challenge of the work, stating that “I want to be pushed a little bit so that I can do my best and show what I’m made of and show my work. I want to do a good job for the college.” They followed this with a discussion around being used, sharing that the most de-motivating aspect of their job is, “Probably people that tend to use you as a stepping ladder to get where they want to be, and they don’t care what it takes to do that. They are the type that tend to un-motivate me.” Alex shared that they really enjoyed installing new equipment and getting everything working, as sometimes the physical pieces are “one of the few things you can see that you've accomplished.” They also stated that the most de-motivating aspects is the paperwork, generalizing that “nobody ever likes to document.”

Kris shared that they find it very frustrating when asked to take over in the middle of a project, especially when someone leaves the organization, as well as when upper management refuses to get over the past. Kris shared an anecdote highlighting this frustration:

> Some of the higher-ups, it's a little frustrating when they hear two horror stories six years ago and they won't migrate to an external service because of that, and now we're stuck maintaining physical Exchange servers, dealing with spam, stuff like that. Whereas, we could offload it and two of our system administrators could be working on other projects, so I would say that is also a frustrating aspect.

On the motivational side, Kris shared:

> The most motivating. I'm gonna say what any IT person would say is successfully finishing and launching a project. The feeling you get after working on something for six months and it goes live and you start looking at analytics. It's getting hammered and it's working good. I think that's one of the best feelings I would say and most rewarding.

They also shared their enjoyment with helping others feel more comfortable with technology:

> A lot of times they'll send student workers or secretaries over and the secretaries are usually older, in their 50's or 60's. They come in, "I don't want to learn any new technology" and we show them the interface and then, "It's all draggy-droppy, it's really easy to use" and kind of joke around with them. They leave with a smile on their face and they're like, "I want to go work on the website." So, seeing someone that was hesitant about working with technology feel comfortable with it after a training session is always a good feeling, too.

Similarly, Sam also spoke about helping others with technology:

> Helping people with new technology. Realizing that we can use an asset better, and can be more efficient at their work and collaboration and stuff like that. So, that's rewarding to me. Rolling out stuff. Not necessarily new technology, but new to those people.

While not specifically calling out management about living in the past as Kris had, Sam spoke about the unwillingness of others to change:

> People who are living in the past and perpetuating bad habits are really not motivational. You know, these guys who have been in the same job for 20 plus years and still using the same bad habits. I mean, I really find that, and I'm sure my wife will testify, that I come home and complain because it bothers me so much. It's just so annoying that, you know, you're in IT and you gotta evolve with the times and move. And the people that are not

> willing to do that, I just don't like working with people like that. So, you know, they should do something else. Obviously, I can't fire everybody, and even if I were in that position, but, um, I'd try to motivate those guys to learn or try new stuff, but it's frustrating and de-motivating to work with guys like that.

Jamie shared their passion for finding ways to enhance systems to help make them easier and more efficient for all university stakeholders and how motivating this is:

> Learning things. Going on new systems. I've taken on so many systems that are done so differently and trying to make them as efficient as possible, that's where I most enjoy myself. Trying to make it as best I can for our end-users. I've done our emergency notification system, our events systems, our learning management system, our card system, and just the ability to learn how to use these systems and what they can do and what options we have out there to make them even better for our users, that's the thing that makes me the happiest when I'm working, is learning about these systems, and learning about all these different things that could be done differently.

Jamie also discussed that sharing bad news with faculty and students, especially in regards to being unable to help them with something is the most de-motivating part of their work:

> Some of the least motivating is when I'm working with the users that I think we have to give them the hard truth of there is nothing I can find that supports what they are saying. I hate doing it. I do spend a lot of time trying to make sure that I'm not wrong in what I'm telling them. So, that way when they come back, if they come back trying to get more information, or when it comes from higher up, "hey make sure you did everything," I want to make sure that right at the first instance I've looked at everything I possibly could

and there's nothing I can possibly find. It's difficult to say that to a user. I know they're not going to like the answer but it's what has to be said.

Summary. Participants were asked to reflect upon a number of personal attributes in It's Who I am: The Ascribed Importance of Identifying as an IT Professional. Participants shared what they believed to be their strengths and weaknesses, such as the ability to explain technical issues to non-technical people or to overcome perfectionist tendencies. Participants considered aspects of their work that they find the most motivating, such as solving complex problems, as well as those they find de-motivating, such as being micromanaged. The participants discussed the various ways in which they communicate with stakeholders, which included email, instant messaging, Slack, and the traditional telephone, as well their preference for each medium and group. The participants also shared information about their hobbies and personal time which included both technology-related hobbies, like PC gaming or home networking as well as completely disconnecting from technology, alluding to the fact that they are not completely defined by their role as an IT professional.

That's Not Me: Being Stereotyped as an IT Professional

While the above section, It's Who I Am: The Ascribed Importance of Identifying as an IT Professional, shared participant self-reflections and stories regarding who they believe they are as IT Professionals, the following shares participant views and thoughts on who they are not. Stereotypes of the profession and those in which it encompasses, along with participant views of the perceptions that outsiders have of them are shared. Participants also shared what they wish others knew or better understood about them and their profession.

Jamie spoke significantly about their perceptions of how others view, not only themselves, but everyone in the profession, highlighting a common claim that every IT professional knows everything about Information Technology:

> It does seem that as an IT professional everybody thinks that, for one, you know everything about computers no matter what it is. People think that you should be able to answer, "why doesn't my computer turn on?" I don't know why your computer doesn't turn on, I'm not a systems guy! A lot of people look at IT as anything that deals with any technology. Whereas they don't see that we all have our own different niches that we're sitting in technology because it's such a large topic. So not everybody can know everything about it. It would be ridiculous. And so, I think that they think you know everything on that. They also say that you kind of live in a hole. And I do know several people that it's the way it sounds like what they do is they work for, you know, eight to ten hours at work, and then they'll go home and will continue to work on something that is, you know, work-related. Or they play video games. And that is a typical stereotype usually heard for people in IT; when you're not at work you're at home playing video games or doing more work type things. It's just not me.

They also spoke about their frustration of having often been disregarded because they were fresh out of college and how that sometimes persists well into their career:

> I've basically been dealing with this since I've started. I had just come out of college, and so basically anything I said was looked at as "oh, you're just a college student what do you know of this world?" Well, I'm the only person who has worked in this system for three years now, so I know it better than anyone else. It's just a fact.

Jamie concluded this part of the conversation reiterating their feelings of being generalized:

> A lot of people seem to generalize us into one thought process that everybody can do everything, and I think that is the biggest mistake that they make. To think that just because you are in this one field that you're this one thing. I mean, if you think of faculty, you can't take a faculty that teaches history and have them teach English. I mean, there is too much information that they'd have to adapt to, to really do it. I mean they could over time, but you can't just switch them from one to the other. The same with IT, you can't just take a person who works mainly with software and tell them to go build a computer. A lot of times, they could fumble through it, but there are some that couldn't tell you anything about the hardware of a computer. So, I think the classification of just IT Professionals is just so broad and people don't realize that it's a broad group of people that have completely different views of what it is to be an IT person.

Taylor shared many of the same feelings as Jamie, in that not all IT professionals know everything about everything:

> There are two things which I think are hilarious. You work in IT and you work at a college. Do you get summers off? In our dreams. They just presume since you work for a school that you can take and do that. The next big thing is, and I think it's funny, too, because many people don't know that there are so many parts to an IT group that, "you can fix my computer, right?" Yeah, no. It was so obvious many people thought that we all knew the same things, same language, same box. Once they start finding out, well, yes, this department works on this box and they can do this, this, and this, and we do this and this. It works together, but they presume it's all one thing. If you go to our financial aid department, they think that the Unix and the scripting, everything done there is done just magically when they click on a button on our stuff. They think we're in control of it

all. It’s hard to explain to them and hard to get to users to understand that no, these steps take different pieces and parts from different areas. It’s not just from one area. Without the work of both areas, you don’t have a product and you don’t have a successful product.

Like Jamie, Taylor ended this part of the discussion with an analogy, highlighting their wishes that people didn’t assume they knew everything:

> I think would be cool is if everybody understood IT wasn’t so stereotyped. When you go into medical, you know what a nurse is. You know what a doctor is. You know what an R.A. is. I wish that we were more aware of, oh, this is what a developer does. This is what networking does. This is what this area does. Instead of throwing us into that umbrella of, oh, you're IT, you can do this and you can work miracles and da, da, da. Will that ever happen? I don't know, but it’s something cool to think about. I think IT people understand it. I just wish the rest of the world would understand it too.

Kris and Sam both shared similar frustrations of being lumped into this stereotype. Kris stated, “It's always, I'm sure you know, you go to a party or a family get together and it's, ‘Hey, my computer has a virus. Do you think you could look at that for me?’” Similarly, Sam shared:

> I don't know what stereotype I am, but I know that all IT can fix all computer problems, and I know that's not true, but I do get characterized like that. But I think it's a challenge that I'm not an expert at, so I don't mind them stereotyping me that I can fix any computer for them. But I know my limitations. I just explain to them that, no, this is not what I do.

Kris continued on, discussing how IT workers are considered the “nerds on campus” and being referred to as the “Boys Club” due to only having a few females in the department.

> It seems like most people want some sort of service being in IT from you. I mean, around campus, I like to say we have a pretty good reputation. A lot of departments call it the

> Boys Club just because we're the only department that's pretty much all male. I think we have three females in our department. It's kind of that, I guess, it shows that we are a tight knit group that they call us that but at the same point it's kind of like, "Ugh." It's probably not the best stereotype to have on campus. You know, it's one of those things that if everything is up and running smoothly, I don't even think people consider IT a lot.

Kris's last sentiment about not being considered at all was echoed by Bobby:

> I do feel like I'm lumped into the old stereotype of, "It's just the IT worker and you know, we'll hear his two cents, but that'd be about it." I think that there's always been a stereotype in IT, that IT has always just been a means to an end, a needed piece to get the job done, but not necessarily a valued component to making the decisions, if that makes sense. It goes back to the stereotype where generally you're not going to hear much about IT until things go wrong or things aren't working right. Then IT steps in to fix the problem.

Alex felt like his group is often blamed for everything and that a lack of understanding for what they do exacerbates the problem:

> I think in networking, as a rule, there are lots of people that don't understand what it is or how it works, so I think they believe we are more of the cause of problems than we really are. I think inside the IT department themselves we are seen as more of a hindrance because we are in charge of the firewalls and stuff like that, and then I think that the end users sometimes see us as a hindrance, too, because a site's blocked for some reason like malware. We have no control. They have to contact the site owner to have them fix it, there is nothing we can do about it.

Casey shared that people often view IT professionals as lazy hermits who never come out of their offices:

> That's kind of tough to say because they don't tell me. That's not the kind of thing they walk up and say, "Hey, I think that you're a hermit and you need to come out of your office more." Most people wouldn't say that even if they think it, but there are still users that think that about me. The thing with IT is, when everything is working no one sees you. So, they think “Why are they spending all this money on IT when they're not doing anything?” Then when something’s broken they think, "Why do we spend all this money on IT, because everything is always down." And there are other people who will sympathize and understand and there's others who just don't get it and they just don't understand. They think IT is just lazy and doesn't do their job or are incompetent and can't do their job, but I'm sure that every workplace gets that to some degree. I know a lot of IT people tend to be more analytical and introverted. I think a lot of non-IT people don't really get that and they just can't wrap their head around it. There might be things, or situations, where they think an IT person is being lazy or rude, but they didn't intend it to seem that way at all. Maybe they're not lazy, and they're blowing you off because literally the server is on fire and they can't deal with your email problem right now and I think it's important to take into consideration their perspective as well.

Summary. In the second theme, That’s Not Me: Being Stereotyped as an IT Professional, participants shared their thoughts and perceptions about being stereotyped and the external perceptions others have of IT professionals and the field of information technology. Participants shared their frustrations about how they are viewed as knowing everything about all aspects of technology, despite the field being broad. Participants also

shared how they felt they are underutilized when it comes to the planning of projects and how they are only thought about when things go wrong.

It's What I do: The Impact of the Work Performed by IT Professionals

The participants spent a significant amount of time discussing their roles, the work they perform, and the impact that work has on the various institutional stakeholders. Participants shared much about the way in which they spend their time, the various duties their roles have them perform, and highlight the benefits they believe they bring to the institution.

Bobby spoke about their various roles at the institution and how these utilize much of their time:

> I have multiple jobs. So, outside of my day job, I teach. And outside of teaching, I go to school. There's very little free time that I have in a given day and my wife can verify that because she yells at me a lot for it. There's very little free time that I have so I'm always involved in some capacity wearing one of these hats for this institution. A lot of my time is spent still understanding, sitting through webinars, sitting through project demos, understanding what is out there, how that can factor into our existing processes, what value add would that bring to the environment and where can we fix the bottlenecks that are currently happening. How can we fix these manual processes that have been in place for thirty years because that's just how it's always been done?

Bobby then shared that much of their time is spent ensuring system available for users to access the resources they need, when they need them:

> We're the ones that are providing a highly-available, technical environment. That means that our users want and expect 24/7 availability for our services. Again, we have a high online presence so users that are across the globe, when they sit down, they have time in

> their day to do their homework or to interact with our systems or login into the website, they expect that and we have a direct factor into making sure that our systems are up and running, make sure that we have DR plans in place, making sure that we have rollback options when upgrades happen or when they fail and things of that nature. I think that, yeah, we play a direct part in what the user has to interact with. Yeah, I think we play a huge part in that and we can pride ourselves on that when it comes to the environment that we give our users, because they just want to focus on learning and what's important to them. They don't want to have to spend their time hunting around for something because it's buried on a website or they don't understand how to change their password because the pages aren't intuitive or they can't get in touch with the support staff and things of that nature.

Bobby also shared his thoughts about ensuring the tools and environments that are provided to faculty, students, and staff meet their needs, and that IT is setting them up for success:

> Again, we need to make sure that we're setting them up for success and we're also saving them from themselves to an extent. I think that's the thing. The phishing email's a great example. It's one thing to say, "Hey you have email and it's readily available. Have at it." It's something different in making sure your users know that there are links that you shouldn't click on and there are implications of clicking on this link that could be bad for the organization or bad for your personal identity.

Bobby ended this part of the discussion around their interaction with faculty and the many different hats they wear in their position in the organization:

> We have a lot of faculty involvement because we kind of wear many hats here. We are trainers. We are, again, second-level support. We're also the key cogs when it comes to

> the content that's being loaded in the LMS. If there's a problem, if there's an issue, or if it's a new rollout, or it's trailing documentation that needs to be created, that all falls to us.

Like Bobby, Kris also wears multiple hats, including that of adjunct instructor at the campus. Kris shared a little about the areas in which their group is responsible, which includes over 45 Linux servers:

> We basically maintain the main website, custom applications, any sort of payment processing that campus needs web-based, we do that. Right now, we have three developers counting myself and one sort of pseudo web master who meets with departments when they need help with their website. Usually we go meet with our clients, I kind of come up with a game plan and then delegate some of the tasks out to our other two developers. We do morning meetings, make sure everybody is still on task, go over what everybody is doing, that sort of thing.

Kris also shared some of the work they perform for the various administrative areas of the college, which often leads to maintaining additional custom applications:

> Usually what we'll do is we'll just we will take their paper process, automate it, and turn it into a web app. If anything, we're saving them time so they can help their department more, stuff of that means. I think we save them time as long as they can accept that they're gonna have to take a more of a hands-on approach for processes after we're done. But yeah, for the most part staff are usually grateful for the work that we do for them.

Kris explained that they try to spend as much time as possible keeping up-to-date, looking at new technology solutions, and monitoring existing systems:

> Usually on the daily average I'll spend an hour or two on different blogs, Reddit, Slashdot, ArsTechnica stuff like that, reading about technology. A lot of our monitoring goes through Slack, so if a service goes down, we'll jump in the Pingdom channel and everybody combines brains if they're not in the office to figure out what's going on.

Kris spoke about the impact they have on students, stating the main reason they are at the university, though students are not always considered as much as they should be:

> I think being able to offer that to students, the flexibility that they can work from home on this stuff is awesome. Obviously, our audience of students is going to be different than you guys. We have a lot of middle-aged people coming back to school, so they're not living on campus. They're not able to come up on campus from five o'clock at night till eight o'clock to work on a project. Them having the ability to remotely connect to the campus resources at, nine, ten o'clock at night after their kids go to bed, I think is awesome and I think they appreciate it. Honestly, they're the only reason we're there. If it wasn't for them we wouldn't have jobs. It's not taken into consideration as much as it should at our campus, I think.

Jamie spends much of the day ensuring that the various technologies and processes under their purview are efficient, and intuitive:

> I will spend a lot of time trying to find out how to do it the way they want to be because you want the system to be intuitive for the user. You don't want them to try and figure the system out. You want them to feel like they already know the system. And so, lot of times when it comes to me, it's showing them how it works now, and then finding out if I can make it better for them. Make it more intuitive. We want to make a lot of the silly things they have to do as easy as possible. Like registering for classes is such a stressful

> process, because you're trying to figure out, okay, what classes can I take? What classes are here? What classes are there? So, developing ways for them to actually go through that process with the least headache that they can; I mean these students are not here to learn how to register for classes. They're here to complete whatever their major is, and so it doesn't have to do with these little things that they're working on. A lot of what you're working on, what we need to focus on, is eliminating those silly headaches that they're getting when using our systems. So that they can focus on what they're really here to learn.

Jamie also spoke about his duties in overseeing the institution's Card ID system, Learning Management System, events management system, many of their custom applications, on top of watching for service tickets to arrive to address issues as quickly as possible. Jamie stated that he spends up to 20 percent of his time looking for new ways to improve their systems. Jamie also shared a bit about the extra time he puts in to ensure things are addressed as expeditiously as possible:

> I would say on average it's probably working two hours extra but, some nights I'm not really doing anything other than checking my email to make sure nothing is going wrong. I mean I'm always looking at my email, which is where our work orders come in and that's our main communication on what issues people are having. So, I'm constantly looking at those to find out whether or not people are having any sort of issues and depending on the need to have those issues resolved quickly, I might hurry up and jump on and work through whatever it is if they're having an issue. Even if it's only affecting one user. I know we have times where a student will email us on the day an assignment is due, and so that's kind of important to make sure the student gets his work done that it's

not becoming a hindrance to both the student and the instructor that he didn't get his assignment done on time.

Alex oversees the physical and logical network for the university, including the installation and maintenance of all physical networking hardware, which include the residential and perimeter firewall. Alex views the work he does as extremely important, stating that, “If my work doesn’t work, they pretty much don’t get anywhere.” Alex believes he only spends one to two percent of his time working directly with students, and mostly in the residence halls. “We support the resident network as well, so if our stuff doesn’t work, they are pretty unhappy. What we provide they assume is just a necessity and should work all the time.” The majority of Alex’s time is spent working with the faculty and staff:

> Probably 20 to 25 percent of my time is working with them. And not necessarily problems, but in working with other departments and dealing with things that need to get accomplished there. Stakeholders on different projects, things like that. Once again, that seems like if our part doesn't work, everything comes to a screeching halt there. Everything rides on the network. Without that they can't do anything.

Alex also stated a close relationship with the facilities department:

> The other big department I usually work with is facilities. We have a much better relationship and have worked to make our life easier with the decision making there, so a lot of times just a phone call will help avoid a lot of panic and frustration there. So, they are learning to get us involved when it makes sense to get us involved. If they ask us for our opinions, they usually use it, they don't just ignore it.

Taylor shared that she has had very little time for researching new things or playing with new technologies due to the migration to a new Student Information System, which has been worsened by turnover:

> Unfortunately, we've had two, over the last two years, people retire from our department and we have hired no one. Especially going to this new system, that puts a lot more responsibility on both my boss and I on what we can do and how much free time we have.

Along with the SIS migration, Taylor is also responsible for maintaining the Financial Aid system, and ensuring that department has what they need. While Taylor admits to spending more time with the staff than the faculty, she believes her goal is to "solve their issues and get them back to teaching right away." The majority of her time is spent working with the SIS, which includes account creation and security, stating that, "Probably about 50 percent of my day I create the accounts for faculty, for staff, and security, and then you're calling them or you're answering tickets, trying to find out what kind of security they need?" Taylor shared that she tends to over-document her work, but that it helps others when she can just send them a document and then walk them through whatever they are trying to do, though sometimes they would rather her just do it for them:

> I have a tendency of documenting more than I should, but it saved my butt many times and it's helped others. At least you have documentation to say, "okay, here, I'm going to email you this. Let's walk through this. You do it and I'm right here and whatever step you're stuck on, let me know. We'll go through it." You've got other ones that only do the run, or request background checks once a year so they forget. That's fine. Documentation, walk. There's some that just basically refuse and want you to do their

> job. It's like, no. I don't get paid enough to do your job and mine. You can't tell them that of course, but you can think it. I'd say I know I spend more time with the rest of the administration group than I do faculty, if that tells you anything. But like I said, about half of my day is working on faculty stuff. The bonus hours are usually admin stuff.

Taylor also shared that she has now taken over all the security aspects of both the new and old SIS, but admits that she has enjoyed the challenge:

> I have taken over all the security for this new system and our other system due to the fact that the closer we get to being off of our student system. We are currently now taking and trying to find new areas that we can become experts in so that we can continue to have jobs. When I started the security thing, it was great. It was fun. It was interesting.

Casey shared that he focuses mostly on Windows and Citrix administration, which includes the university's virtual lab, which is heavily utilized by students and faculty. Though he personally doesn't spend much time with the staff, he believes IT has a positive impact on the staff, stating that, "I mostly run the virtual labs in Citrix, so that's just not something staff aren't going to interact with that heavily. But for my department as a whole, they definitely impact the administrative staff very heavily." Casey then shared how he feels his work could greatly impact that faculty at their institution:

> I think what I do has the potential to impact them a lot. Some things like, they might be mechanical engineering professors that spend ten hours a semester working with students to help them get their CAD software installed. Whereas, if they fully understood and utilized the stuff we give them they wouldn't have to do that because they could get into the XenDesktop and help them stream it and they wouldn't have to install it. It would be much easier.

While Casey believes there exists the potential to impact the faculty in a greater way, he believes the work he performs already has a great impact on the students:

> For what I personally perform directly impacts them quite a bit. Nobody wants to go to the computer lab at 11:30 p.m. to finish their paper that's due at midnight. They'd rather just get on Citrix and do it from their room. Since I run our Citrix stuff, which is virtual labs and everything, that definitely directly and positively impacts the students. Or negatively if I screw it up. But definitely directly impacts that, even if they don't know that I'm the one behind the curtain. And there's other stuff. I literally run the script that creates the student user accounts every term. There's a lot of stuff I do that directly impacts the students.

Casey also shared how he is constantly considering the students when performing his duties and how his actions might negatively impact them:

> There might be a time where I'm doing something like pushing the updated version of the Master Image to our XenDesktop infrastructure. Even though I know it's seamless and it happens in the background and they won't even see it, if I know we're in the middle of finals, maybe I'll wait a week to do it just in case, because you never know. I don't want to accidentally click the wrong button and bring something down and some student loses his test in Blackboard and make him start over, or worst case he fails it because he disconnected.

While most of Casey's time is spent administering the systems for which he is responsible, there does exist time for researching new technologies. Though the time allowed varies by the time of the year. Most large projects and updates only happen in the times where there are no classes, but

outside of those times and addressing tickets as they come in, Corey has an opportunity to look into new things:

> So, times like this, where this is basically our maintenance window for the whole year, is the only one we get pretty much no time at all, because you're busy from the time you get there until the time you leave. But there's other times, a week or two after the term is started, that we get settled in; maybe we have a couple of hours a day to do research or reading or whatever it is I want to pursue.

Summary. In It's What I Do: The Impact of the Work Performed by IT Professionals, participants shared details and stories describing the work that they perform and the impact they believe that work has on the various institutional stakeholders. Participants shared how they oversee crucial university resources, constantly monitoring systems and applications to ensure their availability for students, faculty, and staff. Participants discussed how they spend a significant amount of time evaluating systems, looking for ways in which those could be improved or enhanced, and addressing issues as expeditiously as possible as they arise for students, faculty, and staff.

My Work Environment: The Structure and Culture of the IT Professionals' Work Environment

Each participant shared details and stories about the environment in which they work. This included information around the culture of the institution, as well as the culture of the department. Participants shared the ways in which their institutions celebrated IT successes, though some expressed their frustrations with the absence of such celebrations. Many of the participants discussed the segmentation of the IT department, using the term "siloed" to describe it. Bobby described this segmentation, not only in terms of IT, but in terms of the entire institution:

> The culture in higher ed, when it comes to knowledge management and things of that nature, it's always been traditionally very siloed, and we've had a very siloed effect here. We have ten campuses across the state. Each campus has generally operated on their own kind of path. So we've really been pushing toward centralizing services, centralizing the management of the services, and to kind of bring uniformity to one. There's a lot of benefits to that, but changing the culture is not an easy thing.

Sam echoed Bobby in that these silos exist even outside of IT:

> Well, being a little bit older, I've seen a lot of different cultures, and [institution name] is a very, very siloed culture. Everybody wants their own territory and their own little world. I would like us to be more of a team, with sub-teams, than we are here. Even outside of IT, they are very territorial, so I'm hoping to have IT bridge that gap.

Along with Bobby and Sam, Alex, too, used this term to describe the IT department:

> We do have a problem with siloing because the different groups inside of IT don't always communicate as well as they should. We've taken some steps to make that better, but it's still a problem of the different departments not always agreeing which direction we should go. Sometimes there, well it's not fighting, but there's not always as good of cooperation as there should be.

Jamie shared that the segmentation of the various IT functions was exacerbated by having campuses in diverse geographic location, which made it challenging to successfully communicate with others:

> When I started, it was very difficult to work with a lot of them. It was very difficult when we had more than one institution location. We had the difficulty of everybody wanted to do things their own way as if they were their own entity, which when you have three

> campuses and we are all supposed to be one, any student may go from one location to another, it's very difficult to really communicate with people. We have four different groups that we're broken up into. It's like we have our security, our networks, our systems, our institutional technology, such as the people that do our help desk. We're broken up then so many different ways.

While not from having multiple locations as Jamie, Kris shared similar details of the different IT groups and how some rarely even speak to one another:

> My group, we work most with system administrators. So, our work structure is we have desk top services, help desk, DIM, which is like our Banner people, Blackboard, and then our system administrators and our network guys. Usually, the DIM group, they keep to themselves. They don't really work with us a lot. They might ask for some help with some basic HTML stuff. The only time we ever really interact with them is if we need queries from Banner or check student eligibilities, stuff like that.

Casey shared that due to the small size of their IT department, there really isn't much segmentation, given the small number of employees and being in the same physical location, but that doesn't negate having some who just don't play well with others:

> We are a relatively small IT department. I think we're up to 23 people now. So, we're not really huge or anything. There's other schools where they've got an IT department for each building. We're really all just in one area for the whole school and there's about 20 of us. For the most part, we all get along, but there are always some people that are difficult. Just don't play well with others. We have a couple of those, just like everyone else does.

Taylor shared that while they used to be a single IT department, as the institution has grown, IT has become more segmented:

> Before, we were just basically one IT department, and now we have the separate areas. I guess that's the biggest growth. When someone says something about the IT department, we are an IT department as an umbrella, but under there, there's multiple parts of IT; the technicians, the networking, the developers, the EI and on and on which we never used to have.

Each participant was asked to further consider the culture of the institution as a whole, taking into consideration the way in which people interact, institutional rituals, and anything else that would help describe the way in which the institution operates. Taylor spoke about the growth of the university and how this growth has brought with it a more corporate approach to doing business:

> We went from, I don't want to call us family-owned because we weren't a family, but we went from a close-knit, small business to grown to multiple campuses. Which at that point, once you start growing with multiples campuses, you need to bring in more of the corporate rules and the way you run a business versus just somebody's opinion. That is a big change for many of us, I don't want to call us lifers, but anyone that's got 20 plus years. You ask them the difference of now compared to then, and it's totally different. It was run like a business but it didn't have all the corporate rules, if that makes sense. Now we're bringing in policies and procedures and change management, and I'm trying to think of what else. Different things like this, lots of committees. They have to go through committees to do anything, which makes sense. Maybe this wasn't even a thing back when I hired in, and this is just something new of this century. I don't know. To watch it

> all come in place and make a change, it’s pretty cool, but it’s just weird when you go from something that was very small, was only three or four campuses and you continue to build and build and now everybody is bringing in the corporate philosophy I guess is what I want to say.

Bobby shared a slow-shifting culture, which contains people who have been at the institution for over four decades, and one where the employees are not always a priority:

> Well it's shifting and it's a very slow shift. People have been in jobs forty years and that's all they ever want to do. They just want to come in and click the same things they've always clicked. They want to type the same things they've always typed. They want to go home and get their paycheck. I think that culture is a very understated, very important piece to the bottom line of an organization, because researchers show a happy employee is a productive employee. It seems like maybe that's not fully apparent at times, if that makes sense.

Alex described a slow-moving, conservative culture, with fewer hard deadlines than in the for-profit market:

> They've done some culture studies here, but it's relatively conservative. In the faculty/staff realm it would be a little different there, but they seem to be pretty conservative, pretty cost conscience, sometimes to an extreme there. The work culture itself is fine. It's a relatively easy work environment compared to the for-profit world. There doesn't seem to be as much, you know, they aren't very stringent with deadlines. Those get missed all the time and nobody seems too worried about it. Things seem to move very slowly, but they get done eventually.

Jamie believes the university is focused on student success and meeting the needs of the students, and with the consolidation of multiple campuses, it becoming easier to work with the administrative areas:

> From the university level, I think they're all trying to do whatever they can to best meet the students' needs. To make them happy. I mean, it's who you need to make happy. They're the ones who are paying your bills. When I started, it was very difficult to work with a lot of [the administrative offices]. It was very difficult when we had more than one institution location. Now that we're consolidating, we're down to our adult group and our local campus. It makes it a lot easier, and a lot of people who you are able to see are much more receptive and talk with you. So, much more friendly, and I'm sure if I had actually been on some of those other campuses speaking with those people there, it would have been a lot easier.

Casey shared his views on the institution as a whole, describing some of the faculty and students as "elitist" and "high-strung":

> In terms of the students and faculty, I'll admit that a lot of them are kind of elitist. But we've got business programs and stuff too and those students are generally more laid back. The faculty and the student attitudes tend to go kind of hand-in-hand I've found. The other staff I work with, they generally are laid back, easy to get along with, but there are some high-strung faculty and students, which I think is common in academia, when they want you to drop everything you are doing and focus on their issues right now, even if you're in the middle of building your server and they just can't get into their email or something.

Casey also shared some of this struggles with the way in which IT is downplayed by the executives when it comes time to invest in critical infrastructure, sharing a story about needing to replace the Storage Area Network (SAN):

> When we sat down with our bosses to plan out our three-year plan for what we would be requesting in the capital budget for the next three years, we - this did also partially come from we met with a consultant company about how to grow our Citrix infrastructure and they had recommended this big monolithic SAN to replace ours and also to get all this other stuff on there that should have been on there a long time ago. It was actually, I want to say, almost $200,000 for all this, plus the licensing and recurring cost. And they looked at the number and said, "Well, I don't think I can make that work. We can try to get that next year." And I know we're going to get the same spiel next year. They're going to tell us the same thing next year. "I don't think we can make that work. I'll try and make it work next year."

While most of the participants shared little on their views of the culture of the institution, Kris shared the least, simply stating that, "When I started, it was really lax. We're a small university, so all the staff knew each other. I got introduced real quick to the guys from facilities, people from advising, graduate programs, and stuff like that." Though when asked to consider the culture of the IT department itself, Kris spoke about a relaxed, fun work environment that has changed greatly due to a change in leadership:

> It's pretty lax environment. Our office we have ping pong tables, stuff like that. People meet in the conference and room online to watch movies, play video games, that kind of stuff. Around Christmas time, we usually throw up a couple Counter Strike servers, everybody in the office will play video games for a few hours. In that means, it's pretty

> cool. We got a new chancellor a few years ago and she kind of came through and cleaned house on all of the older higher ups, which sent our department into a scramble. The directors all thought they were on the chopping block. That rolled down hill pretty quick. In the last couple years, I think we probably lost, six to eight full-time employees that have left for other jobs just because of the change in leadership in our campus. So, yeah. It's not as fun as it used to be. They've tightened the budgets a little bit and brought a few of their cronies from their previous campus here, so everybody kind of walks on egg shells anymore.

Bobby spoke about a positive culture where everyone is pretty happy with their job, and turnover is low:

> Well the culture, it's good. It's positive. We have a total IT staff of right around 70 across our organization. That includes campus techs. That includes campus IT managers. That includes the centralized services out of my building, which includes the developers, the sys admins, the security team, things of that nature. The culture is good, and by good or positive, I'm saying that we don't have a high turnover. Everybody usually reports being pretty happy at their job. We don't have behavioral issues popping up. If anything, if the culture was bad, I would assume that we would see more turnover. We would see more issues popping up and we don't have that. We work well together. Again, previously, up until maybe four years ago when we started that shift to managed hosting, even our factions were siloed. We would interact when we had to interact. "Oh, well you know, let's go talk to the developers because they have to do x, y, and z because we need them to do x, y , and z in order to get this done." That's opened up a little bit more as project work has increased. We've actually gotten to know and have better relationships and

> working relationships with these folks. We actually find ourselves maybe spending a little bit too much time in the hallway talking to each other and breaking bread so to speak. Maybe truly understanding the person and not just the name on the other side of that monitor.

While Bobby shared that turnover was very low, Alex perceived the opposite at his institution. Something he contributes to the mix of seasoned and green IT Professionals:

> Our IT department is a mix, actually. They have an unusual culture, where they actually have people who have been here a long time. Either they have people that have been here forever, since they got out of college, or they have new people that seem to recycle pretty fast. Very high turnover in some of our positions. So, that makes it pretty unique. You have some people who have never been in the "real world" that work here and don't necessarily understand how the real work works compared to here. That is a different culture. Not necessarily a healthy culture to have people here that long, or don't have other work experience.

Casey believes culture is driven by management and shared the he appreciates that his manger is fairly hands-off, which works well for most of the people in his area:

> For the most part, culture is kind of driven by management and my manager is fairly hands off. He's not really a micro-manager. If he trusts you and you know what you're doing, then he'll just step back and let you do your thing and he will only really pursue you if there's something he specifically needs or he basically just checks in. He's definitely not over your shoulder at all and I think that trickles down to a lot of people in my department. Where if you're the type of worker that excels at that, who wants to go in and do the work anyways, then it works really well. But if you're the kind of worker that

> tends to be kind of lazy, there's nothing wrong with that, everyone's got at least a streak of that somewhere, then it can kind of suck because there's not really anyone cracking the whip to get you to actually dive in and do what you need to do.

Sam shared that he believes there is a lack of structure around some of the core aspects of their work, such as development and security and how he strives to bring everyone together to form better practices:

> I'm trying to treat people the same in regards to what computers or what new computers they need, and they think they need more computers than everyone else, or they need better computers than everyone else. And so, I'd like to move away from that myself. To get people to see that we are on part of the same team here, and you need to realize that. So, that's one of my little challenges here. Another challenge is our technical debt. They don't have a lot of security practices as far as managing their day-today stuff. They don't have a lot of maturity in how they develop. They just throw stuff in production without testing it. So, you know, it's kind of a joke in IT to build in production, but here, they actual do it. So, it's a difficult thing to teach them being the new guy and the low man on the totem pole. That this is really bad, you know?

Taylor shared that she views their department as a family, and that allows everyone to work well together:

> The funny part is actually everybody treats each other like they’re siblings almost which is eerie at times. I think the only department, they interact well but they’re geekier than the rest of us, is the Unix people. They’re great people. I can honestly say I’m very thankful that all our IT people work good together. There’s quite a few of us that’s been there 15, 20 years. You spend more time at work than you do at home so they become

> your family. We all get along great and we all communicate well. We all tease the Unix guys about their nerdiness, but they're okay too. They're younger than a lot of us, but again it's like your kids. You're a family. That's all I can say. Basically, you're a family and it's great to be able to have someone you can work with instead of fighting against. It makes you stronger. It makes the department stronger.

Participants were asked to consider the way in which IT successes were celebrated, both at the institution and departmental levels. None of the participants express their beliefs that IT successes were celebrated at the institutional level. Casey stated that at the institutional level, they "tend to not play favorites with departments, so if they do a celebration it's an open invite where anyone can come, students, faculty, or staff." Both Kris and Sam shared a similar sentiment, stating that "Usually it's not institutionally; it's more at the departmental level" and "If something comes down to the bottom line, if student retention were to go up, or if they were to attract more students and meet their goals, then everyone gets rewarded. IT in general is not isolated," respectively. At the departmental level, however, Kris shared a story about the successful launch of the new website content management system and how they were recognized:

> We switched content management systems for the main website, migrated 120 sub-sites, set up the new service stack. We did it in a year with a three-man team. When we got that done, our director took us out to Black Rock, which is a steak house, gave us all $500 Amazon gift cards and he really took care of us. The director of university relations at the time, who was the one who does our events now, she gave us a $100 gift card each and then took us to lunch at the farmers market the next day. At the departmental level, I

think they really appreciated it, but at the institution level, I don't think a lot of people really noticed, other than the website looked different.

Like Kris, Casey shared a recent anecdote, describing how their supervisor recognizes them in various ways for the work they do:

> But like yesterday or today, our bosses let us out at 3 p.m. instead of 5 p.m. because there are not many users there and they said “Hey, you guys have been doing great all day so you can go.” A couple days ago, last Friday, it was muffins and bagels and stuff like that. And when they do stuff like that they'll say, "Hey, you guys have been doing a great job! I know you have been working hard on X project, so go home at three, or here's free bagels," or whatever.

Similarly, Jamie spoke about the department celebrating successes with trophies and food but that things have been cut way back in recent times due to financial issues at the institution:

> We used to have more where we would have little get together where we had cake and ice cream, or given little trinkets for whatever we've done. Like I have a statue from one of the upgrades we did because it was such a big upgrade for everyone to go through. So, the bosses were very appreciative of it. And so now I think a lot of things changed when the economy changed, and the University had to adapt financially, because we have a lot less money coming in. So, they try to do or stay away from that as much. We still have some of our bosses who are trying to be very appreciative, by buying us lunch or buying us pizza, ice cream, cake, things like that, to show their appreciation. Um, my boss now tries to do so a lot more. She'll bring in donuts in appreciation for people doing upgrades. She brings in candy all the time, and so they do little things here and there. Not so much

> of the big things we used to have, but, the little things are just as important. The day-to-day appreciation of completing our projects and getting things done.

Taylor, on the other hand, shared that they don't really celebrate success and puts part of the blame on being too busy, stating that:

> It's changed compared to what it used to be again. We're more scheduled tight with meetings and different things. We used to take time for cookouts, but it's more on our responsibility now to line that up and get the ball rolling on that. The only thing right now, and they don't do it specifically for IT but they do it for everyone, is our years of services. Like I said, that's not specifically for IT. Really, to be honest, nothing, unfortunately, but it is what it is.

Bobby shared that successes are rarely celebrated because doing your job well is just what is expected of you:

> Success is very rarely celebrated because it's just the assumption that you're doing your due diligence to roll out a sound product and you're doing your testing and you're doing your use cases. And when we roll this thing out, it's going to be seamless and there's going to be no impact to the end user outside of maybe learning a different click path. As far as celebrating that we just rolled this thing out and, "Hey it didn't blow up," and, "Hey, we're not getting a lot of calls and our users continue to do what they need to do," there's very little patting on the back, so to speak. Maybe things could be celebrated a little bit more. Maybe not with the end users, but maybe internally, to kind of boost morale and things of that nature.

Summary. In My Work Environment, participants shared details and stories about the environments in which they work. Participants reflected upon their respective work

environments, as well as the culture of both their individual department, as well as the institution as a whole. Participants spoke about their organizations being “siloed” and the impact that has on their ability to collaborate with their peers. They described a relaxed work but shared how the lack of consideration and celebration of successes from the organization makes them feel underappreciated.

Choosing Higher Education IT: The Benefits and Drawbacks to Working in Higher Education as an IT Professional

In the fifth and final theme, participants were asked to consider the things they believed to be benefits of working in both information technology, as well as higher education. Most of the participants had little trouble sharing what they felt were the benefits of working in IT and in higher education. Many spoke about the challenge and dynamics of the ever-changing field of technology being something that they loved, as well as learning and playing with new tools and systems. Many reiterated the draw to the laid-back, relaxed working environment of higher education and shared their appreciation for any tuition assistance offered by their institutions. Surprisingly, all of the participants struggled or hesitated when considering the drawbacks to working in higher education. Bobby could not come up with any drawbacks after taking time to consider the question but instead reiterated his feelings towards the industry and profession:

> Well I can't think of too many drawbacks, per se. Like I said, I'm a fan of the profession. I've been here almost 11 years now. If anything, I would like to continue in higher ed in some capacity. I don't think that even if it's just from the IT side of the fence, I don't think that you're getting short-changed with the skills that you learn and your value to an organization. So, even if an IT worker walked out of higher ed, I'm confident, or I feel pretty good, about the chances of that person getting a job in the automotive industry in

> IT, or working for IT in any other industry because, again, IT is ingrained across the business levels of every organization, regardless of the industry. And that's only going to continue to increase.

Bobby continued to share that he loves the dynamics of the field, forcing him to continue to learn and understand what's coming, which he finds both exciting and engaging:

> I think it's a great field to be in because, again, it's dynamic. It's evolving, and it's always going to be that way. It's not something that you just learn a skill. You have to be up-to-date on trends. You have to be reactive to what's out there, and I know that's somewhat contradictory to my previous statement because there's only so much time in the day to be reactive, but it's exciting. It's engaging. I think that's a true benefit. If you think on your feet, you're going to be having a well-versed understanding of the business levels across an organization because technology interacts with everything. So, you get a holistic view of how a business operates, and what's important and what's not. I think being in IT, that holistic view holds true outside of the profession that you're in because technology, if anything, it's going to continue to play a bigger part going forward. It's a fantastic area to have knowledge in, and there's so many things underneath the IT umbrella that you can still specialize in. Whether it's security, or development, or programming, or applications, things of that nature. It's a fun field to be in. It's fun because it's challenging. And it can be frustrating because it's challenging. But it's exciting nonetheless.

Bobby also shared his thoughts on the benefits of working in higher education. Noticeably absent from his response is anything dealing directly with technology. Instead, Bobby shared more on his beliefs on education itself and how the need for the services that universities provide will continue to grow as we move forward:

> I love the higher ed world. I think that this is an interesting time to be in higher ed because as financial assistance is going down, and as tuition continues to go up, as the discussion of the importance of a degree continues to get a little bit louder, or maybe if there is an importance to having a degree, it's fascinating times. There's research that shows there's greater demand than ever for education, but there's also more choices than ever for education, so I think higher ed is always going to be a fantastic field, and a needed area for the world. Working in higher ed, you get to work with a lot of smart people. And I think that's a great thing, and you can kind of be on the cutting edge for a lot of things as well. You want to help shape society if you can. What programs you offer, what skills you're teaching your users, and how are they going to take that and what are they going to do with it? It's an exciting field to be in, in addition to maybe there are other opportunities, too. I mean can you continue to take courses? What are the benefits? Does your institution offer free tuition? Does your institution provide assistance? Then we have the other kind of stuff that can help the motivation levels for users as well, at least for your employees. I think it's a great field. There's always going to have to be people that learn how to do something. Whether that's a four-year college, a two-year college, a place that gives certificates or training, plumbers, and things of that nature. There's always going to be a value there. A need there.

Alex enjoys how technology is always changing and providing new challenges, stating, “It’s always changing. It’s never boring, because something is always changing or breaking or something. If you want to keep your mind sharp, it’s a good place to be.” When considering the benefits of working in higher education, Alex likes the relaxed working environment and stability the environment provides:

> Probably the relaxed working environment. It's a very steady job. It's nearly recession-proof. A lot of stability there. You do sacrifice pay for that stability there, but um, it's not likely to close down in the near future. So, easier work environment and stability are the two points that are the most important there.

The downsides to higher education, from what Alex shared, are the bureaucracy that comes with working in a larger organization, as well as the length of time it often takes to move projects along, or especially the amount of time it takes to purchase equipment.

Like Bobby, Taylor could not think of any drawbacks to working in higher education. She did, however, share her thoughts on the benefits of working in higher education, focusing largely on the tuition benefits and the fact that she was able to find a position at her institution after graduation:

> Working for higher ed has definitely been a benefit for me for the fact that, like I said, I went to college here, interned, work-study, got hired. Not everybody can say that definitely. That was definitely a big benefit. Especially working for the place that I graduated for and them believing enough in their students that graduated to know that this is somebody I want on my team. That was a big thing. I also found it very educational to the fact of, I don't know if you do, but we get discount in tuition. We get two classes free. We had to pay for our books, but we have two classes free per quarter, now to be a semester, that we can take personally. I'm trying to think how it works. Our children for sure, and our spouses, and I'm not sure how far it goes, but it's tuition half off. With the price of tuition nowadays, it's definitely a plus. Can't go wrong there.

Kris shared that he believed the biggest downside to working in higher education is the pay, compared to what can be made in the private section, and that the constant reminder of that is difficult to ignore:

> The pay. Definitely. That's what I would go with. I hate to talk about LinkedIn. You get recruiters every week on LinkedIn. "Join our start up for six figures." "Work from home." Stuff like that. It's real hard to ignore a lot of those offers from GM recruiters, Ford recruiters, stuff like that.

In regards to the benefits of higher education, Kris spoke about how rewarding it is to provide great services to students and how deadlines are a little easier to deal with than in the private section, sharing a story to highlight the former:

> Making the students time on campus not horrible. I don't know how to describe it. I guess I'll just relate it back. When I was at [my previous institution], they had horrible WiFi coverage. You could walk ten feet and all of a sudden you would completely drop your WiFi and that was really frustrating. I look at our campus and we never really have any complaints about WiFi and stuff like that. Offering those services to students and faculty I think are pretty rewarding. Another thing I've noticed with higher ed, compared to the private sector is I set my own deadlines now. It's not that the client says, "I need this next Friday by two o'clock." It's, "Well, you know we can get to it in a month and it'll take us another three weeks to get it done for you." And those people are usually grateful for it when we say that to them. Whereas before, that could be the difference between us losing or winning a proposal. Whereas here, people are a little more grateful and understanding of your time then it is in the private sector I would say.

Kris shared that some of the benefits of working in the field of IT are that he gets to play with the "coolest toys." He also continued speaking about the benefits of his current position in higher education, comparing it to previous corporate experiences:

> You get to play with the coolest toys. Honestly, coming [here] from a smaller company that I worked at before, I come here and all of a sudden it's like, oh, you've got your own hypervisor. You just create your own VM's, do whatever you want. Order whatever you need. Training is awesome. Every year I go on a big conference for Drupal. I've been to Educause a couple years. We go to the Merit Member Conference every year. I think the training more than anything. So, yeah. Training, the new technology, always having a brand-new laptop every year, stuff like that. Getting to work with younger people is always cool. Sometimes they come in and they think they know everything and you gotta kind of mentor them and explain to them the world doesn't revolve how they think it does. But yeah, solving problems with the latest technologies. Pretty good, I think for me, for why I like IT.

Sam echoed Kris's sentiments about being aby to play with the latest and greatest technologies and how working in IT allows him to help others out with issues they may be having with their personal computers and devices:

> I guess I get to play with the latest technologies, that's a nice thing. You know, I think the benefits of working in IT, I can help my family and my friends make good decision. You know a lot of people have a difficult time. They think they have a virus and they don't, or they have a virus and don't realize it and they have me look at their computer so, you know, it's not just work, I'm not just drudging myself off to work. It helps me outside of work, too.

Sam mentioned that some of the drawbacks to working in higher education are that often times there is a lot of “technical debt” that never gets taken care of, and while there are some things that are on the cutting edge, other areas of IT lag behind. While Sam did not elaborate much on the drawbacks to working in higher education, he did speak to the benefits of such. Like Kris, Sam focused a lot of what he shared around empowering faculty and students, enhancing the experience of the technologies they use, and how rewarding these things are:

> You know, empowering these guys to use technology. Empowering the faculty to use the tools they have to give a better presentation to the student, and not just a PowerPoint presentation, but an overall, whatever their curriculum is presentation. Like we are using some newer aspects of Moodle to do different types of quizzing, like video-type quizzing, and stuff like that. So, using technology so people can do more with the same. They can actually teach old materials using the tools they have, so they can cram more into a single class. You know, I think that's better. Just, um, giving back. The State, and working for the government, there was just cool things you could do. You could get people to do stuff on their phone that they never get, like hunting or fishing licenses on their phone, which they couldn't do. That was very rewarding. So, at the college, I want to be able to do the same things. I want to be able to make a change. Make it so they can register for classes on their phone. They can change their advisor on their phone. We are trying to do things like that. Simple things like paper processes we can do. Not just on the web, but do them through the devices that the students are actually using, you know? Trying to get everyone to realize that students are using computers even less and less. So, I know how to get stuff on the phones, so that's good that. Especially on a college campus.

Jamie, like many of the others, enjoys the rate in which technology changes and the challenge that poses, comparing it to other fields that are not as quick to change as time moves on:

> We constantly have people who are asking to use new systems or to integrate with new systems, that it gets you to see all the other ways that people are doing it, and then you can also try to learn to adapt your stuff too, you know, in similar ways. I mean, it's kind of constantly growing. Constantly adapting to the way the technology is now, that it's something that will ever slow down. So, that it always keeps that interest. I'm like, "Oh, what's coming next?" and trying to stay ahead of the curve. It's just a very interesting field to be in. You look at some of the other fields like building or carpentry. A lot of things don't change from time to time. Yeah they'll use some different techniques but you don't have something that's constantly adapting.

In regards to the benefits of working in higher education, Jamie spoke about the ability to see the larger picture, in comparison to the corporate world, where you might only know about the small piece of the whole that you are working on:

> Sometimes in corporate, you are developing one piece of a much greater product. So, all you're seeing is the tiny, tiny speck in the whole spectrum of what it is, and so it's a lot harder to feel that great sense of accomplishment when all you're saying is, "Oh I did this little thing and hopefully somebody notices it." Whereas in higher ed, you're usually developing things on a much larger scale that you know people are going to see, and you know people are going to notice what you did. Whether or not you ever hear about it or not, you usually have a much larger impact than what you're going to see in the corporate environment.

Jamie also shared that the one drawback he sees in higher education is that often times you tend to get stuck performing the same tasks, or get caught up in the same cycle of work semester after semester, year after year, where in the corporate world, once you finish a product, you get to move on to something new.

The only drawback that Casey shared to working in higher education is that the pay is generally lower than in the private sector. Even though the compensation might be lower, Casey still believes that the rest of the benefits more than make up for it, especially when it comes to the tuition benefits his institution offers:

> I know that, for us at least, our benefits are pretty good, even if the compensation isn't, the benefits are. Stuff like, they have tuition assistance where they'll pay for 99 percent of your tuition if you want to take classes there. And because you work there, they'll work with your schedule. Your managers will work with you if you have to take two hours off in the middle of the day to go to class, and then you just work two hours later that day. They're totally okay with that. That's a fantastic benefit. Or if I have college-aged kids. They can use my tuition assistance, and it's a pretty good school. They could go there essentially for free. I have to claim tuition as income on my taxes, so it's not strictly free, but it's still a deal. It's a lot better than having to take out loans or having to pay out of pocket. So, stuff like that is great for working in academia.

When it comes to the benefits of working in IT, Jamie shared that playing with new gadgets and software, along with solving problems are some of the reasons he enjoys it:

> I've always been kind of a tinkerer anyways. Just wanting to find new gadgets and try new software and stuff like that. So, being able to do that at work kind of enables me to do that stuff with work funds, instead of having to buy servers for my basement. Or we

take home the old servers and we get new ones instead of having to go buy one, stuff like that. I think certain types of personalities really like IT because they like the problem-solving. All they want to do is to work a problem and figure it out, and I think I'm one of those people. So, it kind of just like scratches an itch I guess.

Summary. In Choosing Higher Education IT, participants shared the benefits and drawbacks of working in both information technology, as well as in higher education. Participants shared that they enjoy working with new technologies and the rate at which the field changes. They also shared how they appreciate the benefits of working in higher education, such as working with faculty and students, the tuition benefits, and the flexibility the environment offers. They shared that some of the drawbacks to working in higher education are the lower salaries and the enhanced bureaucracy compared to that of the private sector.

Relationship of Themes

A framework was presented in Chapter II that was used in crafting the interview protocol, as well as a guiding lens during analysis of the collected data. At the individual level, the areas of technology, motivation, and culture help to define the essence of being an IT professional working in higher education, with a relationship formed between each area. There is also a relationship between the individual IT professional and the larger organization in terms of student learning and operational effectiveness. In much the same way as the individual elements impact one another, each could have an impact on the organization as well. Table 2 below shows each theme that emerged in this study in relation to the conceptual model, with the theme names abbreviated for easier reading:

Table 2. Themes in the Conceptual Model

Technology	Motivation	Culture	Student Learning	Operational Effectiveness
It's Who I Am	It's Who I Am	That's Not Me	It's What I Do	It's What I Do
It's What I Do	Choosing Higher Education IT	My Work Environment	Choosing Higher Education IT	Choosing Higher Education IT
That's Not Me	My Work Environment	Choosing Higher Education IT	My Work Environment	My Work Environment
My Work Environment				
Choosing Higher Education IT				

The first theme, It's Who I Am: The Ascribed Importance of Identifying as an IT Professional, can be found across both technology and motivation areas of the conceptual model. Participants shared their strengths and weaknesses, which included troubleshooting technology issues and being responsible for a large range of systems and applications. For some, weaknesses included their coding or scripting skills, or staying up to date on new technology trends. While it became clear in other themes that IT professionals are not solely defined by technology, technology does play a large piece of who they are, as most of their job duties focus around the stewardship of technological artifacts. Participants also shared a variety of motivators, such as problem solving, the challenge of new work, and helping others feel confident with technology. Participants also described de-motivators, such as IT taking the blame when things go wrong and educational leaders being unwilling to change. The conceptual model highlights the relationship between technology and motivation, where a change in one can impact the other. This can be found in the first theme. A change in the technology, such as implementing a new system, can impact the IT professional's motivation. This type of change would provide a challenge to learn

and implement something new, which was described by many of the as something that would be motivating. Likewise, allowing technology to become stagnant due to leadership's unwillingness to change was described as a de-motivator for participants.

The second theme, That's Not Me: Being Stereotyped as an IT Professional, can be found in both the technology and culture areas of the conceptual model. One of the biggest frustrations shared by participants was an over-generalization of IT professionals in terms of technology. Participants shared their frustrations about how they are viewed as knowing everything about all aspects of technology, despite the field being broad. Each area of IT works with different technologies, with each requiring a different skill set. As Jamie stated, "I don't know why your computer doesn't turn on, I'm not a systems guy!" As the technology changes and crosses functional domains, the skills and knowledge to implement and support the technology changes as well, and this is not always in the realm of expertise of every IT professional. Participants also shared how they felt they are underutilized when it comes to the planning of projects and are only thought about when things go wrong. As Kris stated, "You know, it's one of those things that if everything is up and running smoothly, I don't even think people consider IT a lot." A culture where university leaders fail to leverage the expertise of IT can directly impact the technologies chosen to solve a problem as well as the amount of effort it takes to implement and maintain that technology.

The third theme, It's What I Do: The Impact of the Work Performed by IT Professionals, sits firmly in the technology, student learning, and operational effectiveness areas of the conceptual model. Overseeing crucial university technological resources, ensuring systems are working properly and are available, expeditiously addressing issues and service requests, and constantly looking for ways in which to improve systems and processes all fall under the

purview of the participants. It should be of no surprise that technology sits in the center of what IT professionals do. The participants shared their thoughts on how the work they do impacts student learning. From the third-party applications that are implemented and tweaked, to the custom applications that are developed, all have a direct impact on student learning. Kris shared how his work enables non-traditional students to take classes remotely. Bobby then shared that much of his time is spent ensuring that systems and resources are available for users when they need them. Jamie discussed developing applications and solutions to make things easier on students, stating that, "We want to make a lot of the silly things they have to do as easy as possible." Similar sentiments were shared in regards to operational effectiveness. The participants shared that they spent significant time looking for ways to improve or automate processes for the various business units on campus, developing custom web applications, and helping administrative staff learn to better use the tools they have at their disposal. The changing needs and requirements of both the academic and administrative sides of campus directly impact the technologies implemented and supported by IT professionals. In a similar fashion, the technology developed and implemented, such as the automated scripts and custom web applications, have a direct impact on student learning and operational effectiveness.

All five areas of the conceptual model encompass theme four: My Work Environment: The Structure and Culture of the IT Professionals' Work Environment. When considering the culture of the organization, many participants spoke about it being fragmented or "siloed," which created problems in properly communicating with one another. Despite the segmentation, many participants described the working environment as relaxed and less stressful than that of the private industry, with time provided to investigate new tools or to attend conferences. All of these things can impact the technology of the institution, as well as the motivation of IT

professionals. As demonstrated through their stories and anecdotes, developing and implementing technological solutions for students and faculty can be a positive motivator for IT professionals. As an example, Sam stated that “empowering the faculty” is one of the best aspects of working in higher education. The focus and prioritization of the institution, however, can have an impact on all the other areas. If the culture is one that focuses more on the operational side of the institution, resources and technology will be leveraged towards enhancing the business processes, and less towards teaching and learning, which was often described by participants. “Honestly, I can’t tell you the last time I was directly involved with a student” shared Bobby. This impacts the work assigned to IT professionals, which in turn impacts the technologies that are implemented and supported.

It is no surprise that the final theme, Choosing Higher Education IT: The Benefits and Drawbacks to Working in Higher Education as an IT Professional, can be found in all areas of the conceptual model. Participants spoke to all these areas when discussing the benefits to working in higher education. As Bobby shared, for some areas of higher education technology, you get to be on the cutting edge of what is out there. Participants shared that they enjoy the relaxed, flexible working environment of higher education and a culture where time is allotted to learning about new technologies and how they might improve the institution. The participants are motivated by helping and empowering faculty, students, and staff. They enjoy helping to solve the complex business problems of the institution and finding ways to improve operational effectiveness. All of these areas have an impact on the participants’ decision to work in higher education.

Considering the five themes in terms of the impact on the technology, culture, motivation, student learning, and operational effectiveness helps to demonstrate how all these

relate to one another. As with the components of the conceptual model, impacts to one theme could have implications on another, as demonstrated above. All of these pieces fit together to help to define the essence of being an IT professional working in higher education. Further implications of each of the themes are discussed in chapter V.

Summary

Chapter IV provided the results of the study. Analysis of the data resulted in 39 codes, from which five themes emerged. The first theme was It's Who I Am: The Ascribed Importance of Identifying as an IT Professional, where participants shared about their hobbies, motivation, strengths, weaknesses, and the ways in which they communicate. The second theme was That's Not Me: Being Stereotyped as an IT Professional, where participants shared their thoughts and perceptions about being stereotyped and the external perceptions others have of IT professionals and the field of information technology. The third theme was It's What I Do: The Impact of the Work Performed by IT Professionals, in which participants shared about the work they perform and the impacts that work have on the various institutional stakeholders. Theme four was My Work Environment: The Structure and Culture of the IT Professionals' Work Environment, where participants shared about the work environment and the culture of both the institution and the department in which they work. Theme five was Choosing Higher Education IT: The Benefits and Drawbacks to Working in Higher Education as an IT Professional, where participants shared the benefits of working in both information technology, as well as in higher education. Chapter V provides the discussion of findings, conclusion, implications for practice, and recommendations for future research.

CHAPTER V

DISCUSSION, RECOMMENDATIONS, AND CONCLUSION

The job of IT professionals is to design, implement, and support the critical technologies that all university stakeholders rely upon. This is a group of people that are absolutely critical to the success of the organization, but one that is often misunderstood, underutilized, and underappreciated. As institutions of higher education continue into the digital age and continue to become increasingly dependent upon technology, it is crucial to better understand those who are charged with the implementation maintenance and support of the technologies that allow faculty stakeholders to be successful. The purpose of this phenomenological study was to explore the essence of being an IT professional working in higher education. The focus of this study was to gain an understanding of the technical, motivational and cultural needs of IT professionals working in higher education. Phenomenological research examines the feelings, biases, and attitudes and seeks to uncover commonalities among participants' experiences and perceptions (Simon, 2006). As the purpose of this research was to discover the essence of what it means to be an IT professional in higher education, a group on which little literature exists, this was the methodology chosen for this study. This chapter provides an overview of the findings, implications for practice, and recommendations for future research.

Summary of Findings

Data for this study were collected using in-depth, one-on-one, semi-structured interviews with seven participants from six different four-year degree-granting institutions in the state of Michigan. Using Moustakas' (1994) suggested method for analyzing data in phenomenological research, along with Glaser's (1965) constant comparative method, 39 codes were discovered, that were combined to form five themes: It's Who I Am: The Ascribed Importance of Identifying

as an IT Professional; That's Not Me: Being Stereotyped as an IT Professional; It's What I do: The Impact of the Work Performed by IT Professionals; My Work Environment: The Structure and Culture of the IT Professionals' Work Environment; Choosing Higher Education IT: The Benefits and Drawbacks to Working in Higher Education as an IT Professional.

It's Who I Am: The Ascribed Importance of Identifying as an IT Professional

In attempting to gain insight into the way in which IT Professionals who work in higher education view themselves, participants were asked to reflect upon a number of different personal attributes. One interesting observation in regards to the way in which participants described their strengths and weaknesses is that while most only hinted at the truly technical pieces, all elaborated greatly in terms of their soft skills. Participants shared strengths such as being able to work well with various stakeholders, relate and explain technical issues to non-technical people, adapting quickly to changing technology and environments, and their commitment and leadership skills. While discussing their personal weaknesses, the same was observed. While some mentioned technical pieces like their coding skills, the conversation centered around aspects like social shortcomings, documentation, overcoming perfectionist tendencies, and trying to stay current in the field.

When considering the things that motivated them the most, participants shared a variety of motivators, such as problem solving and the challenge of new work. There exists, however, an underlying tone that permeates throughout the participants' responses: helping others succeed. Whether being stated directly, such as by Bobby and Kris, or indirectly, such as by Taylor and Jamie, all participants eluded to the fact that helping others succeed is an important motivator for them. Similarly, while there were many specific de-motivators shared, all the participants spoke about not being able to simply focus on the problems that need to be solved. This came in the

form of being micro-managed, having past perceptions and experiences of the leadership team get in the way of moving forward, and having to spend time battling the political pieces.

All the participants use a variety of methods to communicate with the various stakeholders, including email, instant messaging, Slack, telephone, or simply walking over and speaking with someone in person. Each participant expressed his or her preference, which might be different based upon those to whom they are speaking. Many participants stated that they prefer a technology-based method for communicating with their peers, but preferred face-to-face conversations with those outside of their department. The commonality among all the responses, however, resides in the participant's desire to fully understand the problems and where the stakeholders are coming from. Whether it is face-to-face to have a true back-and-forth conversation as Jamie stated, or to have a digital history of what was said as stated by Casey, all participant responses were focused around the method in which they could best capture and understand the needs of their various constituents.

The participants also shared a little about their hobbies and how they spend their time outside of work. Many of the participants spend ample time with technology-related activities, such as collecting vintage computers, gaming, or helping family and friends with their technology issues, while others admitted to trying to stay away from it once they leave work. Whether hobbies included technology or not, each participant alluded to the fact that they are not completely defined by technology or their role as an IT Professional.

The stories and information shared by participants around their hobbies, their motivation, the ways in which they communicate, and their strengths and weaknesses help provide insight into the way in which IT Professionals who work in higher education view themselves, which is

an important aspect of understanding what it's like to be an IT Professional working in higher education.

That's Not Me: Being Stereotyped as an IT Professional

The participants all shared their thoughts about a few specific stereotypes and external perceptions that are usually made in regards to IT Professionals and IT in general. The first is that because they identify as an IT Professional, they know everything that encompasses information technology. Participants believe that this is far from the truth, yet it is something they deal with on a regular basis. As Jamie stated, "people don't realize that it's a broad group of people that have completely different views of what it is to be an IT person." Taylor adequately summed up this sentiment with, "I think IT people understand it. I just wish the rest of the world would understand it, too." The second is that nobody sees IT Professionals if everything is working correctly, and they are not even considered unless something goes wrong. While the participants do not hold to the belief that they are "lazy hermits who never come out of their office," many did share their feelings about being under-appreciated or completely disregarded until something goes wrong. As Casey suggested, perhaps they are not seen because they are dealing with problems that others are unware of, or in Casey's words, "because literally the server is on fire and they can't deal with your email problem right now."

It's What I Do: The Impact of the Work Performed by IT Professionals

The participants all shared details and stories describing their day-to-day work. While each participant's responsibilities varied from the others, all are equally important to the success of the institution. Overseeing crucial university resources, such as the learning management system, student information system, virtual labs, custom applications, event and course

registration systems, and the myriad other systems and applications that fall under the purview of the participants keeps them busy day in and day out. On top of ensuring the systems in which faculty, students, and staff rely heavily upon are working properly and are available, all the participants address tickets from all areas of the institution for their respective systems as expeditiously and professionally as possible. While each participant's primary duties included systems that might differ between participants and institutions, all the participants discussed their roles in a similar fashion. The real work that each spoke about was constantly looking for ways in which systems and processes can be modified to improve the experience and efficiency of faculty, students, and staff alike. From Bobby's comments on "Making sure that we're doing our job and really exhausting our search for integrations or even just built-in tools that are available to the users and making sure they know how to use them" to Jamie's statement of "You want the system to be intuitive for the user. You don't want them to try and figure the system out. You want them to feel like they already know they system," it's quite obvious that the real work the participants do is ensuring faculty, students, and staff can do what they need to do in the easiest, simplest way possible.

My Work Environment: The Structure and Culture of the IT Professionals' Work Environment

Participants shared details and stories about the environment in which they work. Each was asked to reflect upon their work environment and the culture of both the institution as a whole, as well as their individual department. They were asked to consider the way in which successes were celebrated and the way in which people worked. Many of the participants spoke about their organization being fragmented or "siloed." Despite many of the participants stating that they believe people worked and communicated well together, they also made many statements to the contrary. Kris, while speaking about some of the areas in his department, stated

that, “They keep to themselves. They don’t really work with us a lot.” Jamie commented that, “It’s very difficult to really communicate with people. We have four different groups that we’re broken up into.” Alex also made a similar statement in that, “We do have a problem with siloing because the different groups in IT don’t always communicate as well as they should.” While it might not be obvious to the participants while going about their daily duties, it appears as though the siloed structure of the IT organization has a negative impact on communication and collaboration between the various functional units.

Participants also described their work environments as being relaxed and laid-back, despite claiming to have enough work to keep everyone quite busy. While participants described their working environment, many hinted that their organization has begun shifting towards taking on a more business-like approach to management and work that might have hindered some of the enjoyment that use to be found in the office. In referring to the leadership change on campus, Kris made the statement, “It’s not as fun as it used to be.” Taylor also commented on this shift, by stating that, “It was ran like a business, but it didn’t have all the corporate rules, if that makes sense. Now we’re bringing in policies and procedures and change management.” Taylor followed this up with, “Now everybody is bringing in the corporate philosophy I guess is what I want to say.” This lack of appreciation and diminished enjoyment can also be found during the discussion of the celebration of IT successes. Only a few participants stated that they simply do not celebrate IT successes at all. The rest told a similar story of successes being celebrated more in the past, whereas today, acknowledgments and celebrations are left to the individual managers to handle, with very little coming from the top of the department or institution.

Choosing Higher Education IT: The Benefits and Drawbacks to Working in Higher Education as an IT Professional

Participants were asked to consider the things they believed to be benefits of working in both information technology, as well as higher education. In regards to the field of information technology, participants shared aspects like “you get to play with the coolest toys” and “I get to play with the latest technologies” as well as “new gadgets and try new software and stuff like that.” One aspect that was found to be true across all participants is the draw to the challenge of this ever-changing field. Participants enjoyed working in IT because they love technology and the rate at which technology changes. As Bobby stated, “It’s a dynamic field that I’ve always found to be exciting and engaging.” Words such as “new” and “latest” were frequently heard when listening to the benefits of working in IT. Kris shared that he spends a few hours per day reading about new technology, while Taylor shared that even for the things in which she is not responsible, she still talks to co-workers in other areas to, “find out what’s new” and to be “up-to-date on information.”

Few participants were able to think of any downsides to working in higher education, though wages were mentioned a few times in terms of being less than comparable to corporate positions. The other attribute that was shared, both directly by some and indirectly by others, was that around the bureaucracy of the institution. An example of this is Alex stating that, “Sometimes it seems to take a long time to move things along. A lot longer than it should. In the corporate world things move pretty quickly.” Another example is Casey’s story about leadership bringing in consultants to analyze the issue with their existing SAN, only to ignore the recommendations and push it off to future years.

While few could think of any real downsides to working in higher education beyond the rate of pay, all were able to identify many benefits. Many spoke about the tuition benefits offered by their institution and how this could help not only them, but their family as well. Many also shared how much they appreciate the relaxed work environment, often comparing it to their experiences or knowledge of working in the private sector. While there were many intrinsic and extrinsic benefits shared, empowering faculty and students and helping people with technology was the thing that shined through in all the participant responses. “Empowering these guys to use technology,” as shared by Sam. Bobby shared that “the key part is you are providing your users with an experience that is something they feel they are happy with.” Others spoke about getting to work with younger people, and teaching technical skills to users, as being benefits to working in higher education. All these things revolve around helping others with technology and empowering university stakeholders. As Kris put it, “making the students’ time on campus not horrible.”

Essence of Being an IT Professional Working in Higher Education

The days IT professionals in higher education are spent monitoring critical resources, ensuring the systems that students, faculty, and staff depend upon are available and running optimally. As issues arise, or as assistance is needed from the various university stakeholders, IT professionals work to address the issues or needs as expeditiously as possible. In regards to work orders for issues, Jamie said it best:

> I'm constantly looking at those to find out whether or not people are having any sort of issues and depending on the need to have those issues resolved quickly, I might hurry up and jump on and work through whatever it is if they're having an issue. Even if it's only affecting one user.

While systems are stable and tickets are low, IT professionals research ways in which systems and processes can be modified to improve the experience and efficiency of faculty, students, and staff alike. As Bobby shared,

> A lot of my time is spent still understanding, sitting through webinars, sitting through project demos, understanding what is out there, how that can factor into our existing processes, what value add would that bring to the environment and where can we fix the bottlenecks that are currently happening.

Jamie also highlighted this with, “If it weren't for us trying to make some of those processes much shorter, I mean we would have a lot more administrative staff that would just be doing silly data entry.” These times are often fewer than IT professionals would like, which tends to lead to an overabundance of technical debt, where temporary fixes and tweaks are never fully addressed or remediated, often making it more difficult to ensure the stability of critical systems. As Sam mentioned, his institution is “heavy in a lot of technical debt.”

Despite all efforts to ensure the critical resources that students, faculty, and staff rely upon to be successful are available and optimal, IT professionals often feel under-appreciated. When new initiatives are undertaken by leadership, IT professionals are often ignored until implementation time, where they are then asked to “make it work,” rather than being brought in at the beginning to have their expertise utilized during the planning processes. As Jamie shared,

> There are a lot of times that from my viewpoint that they bring us on a little too late. They don't really think of the things that we're going to think of, what we're going to need, like what are we going to need to accommodate.

Bobby also shared a similar sentiment, stating that:

> I think they just think, “You know IT, we'll get the buildings all set facilities-wise, they'll come in and throw a couple switches and then everything will work fine.” There's no consideration of rewiring, access point coverage, stuff like that.

After successful implementation or completion of a project, recognition for a job well done can be found with direct supervisors, but rarely by the department or institution. The feeling they are not even considered unless something goes wrong is often shared among IT professionals. As Sam so succinctly put it, “Usually when it’s gone critical, that’s when IT gets called.”

IT professionals working in higher education use a variety of methods to communicate, often documenting the conversation for future reference. This could be in the form of a ticketing system where stakeholders submit service and support requests, email, digital workspaces such as Slack, instant messaging systems, or simply speaking face-to-face. The siloed structure of the IT organization adds a challenge in collaborating with peers in different areas, which are often broken up by function. Bobby shared that, “Even our factions were siloed. We would interact when we had to interact.” Alex shared that, “We do have a problem with siloing because the different groups inside of IT don't always communicate as well as they should.” Despite being broken up by function and skills, such as networking, software development, and system administration, those outside of IT often hold to the stereotype that all IT professionals know everything about all aspects of technology, which is frustrating for IT professionals. This often leads to awkward and uncomfortable conversations with stakeholders explaining that the question or problem they have is not something they can help with, as their expertise lies in a different aspect of information technology. “I don’t know why your computer doesn’t turn on, I’m not a systems guy!” stated Jamie. Kris shared, “It’s always, I’m sure you know, you go to a

party or a family get together and it's, 'Hey, my computer has a virus. Do you think you could look at that for me?'" Taylor summed up this feeling well:

> I wish that we were more aware of, oh, this is what a developer does. This is what networking does. This is what this area does. Instead of throwing us into that umbrella of, oh, you're IT, you can do this and you can work miracles and da, da, da. Will that ever happen? I don't know, but it's something cool to think about. I think IT people understand it. I just wish the rest of the world would understand it, too.

Despite feeling under-appreciated and misunderstood, IT professionals working in higher education enjoy the challenges of the ever-changing field of technology, and empowering faculty, students, and staff by providing technology and infrastructure that is reliable, secure, and available when they need it.

Implications of Findings and Discussion

The findings of this study hold many implications to institutions of higher education who employ IT Professionals to design, implement, and maintain the technology relied upon by faculty, students, and staff. The following section discusses the implications of the findings around motivation, communication, retention and hiring practices, appreciation, and partnering with IT professionals, as well as how these findings relate to existing literature.

Motivation

As Singh (2006) stated, understanding what motivators work best in a given situation is key to motivating IT professionals. This study revealed that being challenged is an important motivator for IT professionals working in higher education. This challenge does not necessarily stem from the pressures of doing more work, but rather the push to solve complex technological problems and to understand and implement new technologies. Participants shared how they love

the challenge the work provides, such as Bobby stating that, “I like the idea of being challenged because, again, I think that being in IT is dynamic and there’s always a problem out there to be solved” or Kris sharing, “When you're actually challenged with something that you have think about, you have to communicate with other people, bounce ideas off each other. That's the stuff that keeps me more motivated.” This is a similar finding to that of Tonial (2009) who found that when examining IT professionals in management positions in large U.S. companies, they generally enjoyed challenging and innovative work. This also strengthens the argument made by Smerek and Peterson (2007) who asserted that the work itself is a strong predictor in job satisfaction and the retention of IT professionals. It would appear, then, that the challenge of IT work is a motivator across industries, as well as for those in the different areas of IT. This study also found that IT professionals in higher education find being micromanaged as a significant de-motivator. This aligns with the findings of Mitchell (2015), who found that IT professionals are more motivated when leaders provided freedom and autonomy. The findings of this study lend additional credence to those found by Holmes (2006), who found that vacation, health insurance coverage, and job flexibility were all things that motivated IT professionals. While no participant specifically mentioned vacation, most shared their belief that their institution offered great benefits, such as free or reduced tuition, and also shared that their supervisors were quite flexible in work hours to accommodate classes, to which participants were quite grateful.

Motivational Opportunities. The findings of this study provide additional motivational factors that university leadership should consider in regards to motivating IT professionals. In understanding that IT professionals appreciate challenging work and solving complex problems, leadership can use this knowledge to formulate better strategies for solution design activities around university problems. Often times in higher education, as shared by many of the

participants, university leadership bring IT into the loop once a solution has been found and is ready to be implemented. An alternate approach that would feed into the motivation aspect of being challenged and solving complex problems could be to present the problem to IT professionals and allow them to use their expertise to assist with coming up with a variety of solutions, along with the benefits and drawbacks of each. Not only might this provide solutions to university problems that might never have been considered by university leaders, it would provide further motivation for IT professionals, and it could potentially decrease the risk of IT employee turnover (Smerek & Peterson, 2007). A similar finding of this study in regards to de-motivators and university leadership, and one that was absent in existing literature, was that IT professionals are de-motivated when leadership allows past perceptions to hinder the ability to move forward with a solution or technology. Kris shared an excellent example with the story of leadership hearing "two horror stories six years ago" and refusing to consider migrating email to a hosted solution. Leadership should approach every problem or opportunity with an open mind. Every institution is different, and while it is a great and beneficial practice to look at what peer institutions have done, there needs to be more emphasis on understanding all the factors of the current situation and how they impact their own institution before dismissing ideas or solution that could positively impact the IT organization or the institution as a whole. In essence, treating the situation like a mini case study, and fully understanding the nuances of the peer institutions' efforts could highlight the many differentiating aspects and allow for more informed decisions to be made. This needs to be done with the assistance of the IT department, where the subject matter experts can help explain these nuances and provide guidance on best practices, highlight opportunities for improving upon the implementation strategy utilized by the peer institutions, and providing direction for next steps.

Along with helping university stakeholders see the work that needs to be completed, being more transparent in the work that IT performs would also provide more opportunities to celebrate IT successes. As discussed earlier, after successful implementation or completion of a project, recognition for a job well done can be found with direct supervisors, but rarely by the department or institution. One possible factor might be that those outside of the targeted group might not even know there was work performed. Projects might be for one specific area of the institution, such as the registrar's office, and might only be known by that one department. By providing a way to view the current and pending work of the various areas of IT, all areas of the institution would have greater insight into the efforts and accomplishments achieved by the IT department, and how those align with the larger institutional goals. Highlighting these achievements through internal newsletters or email lists would be a simple method of distributing kudos for work well done. For larger campus-wide projects, a university sponsored luncheon would be another low-cost method to show appreciation. These types of acknowledgments might go a long way in boosting morale, providing positive motivation, and reducing the likelihood of employee turnover.

Teaching and Learning Opportunities. This study also added to the anemic body of existing literature on the impacts of student learning on IT professionals and their motivation, as well as the impact that operational improvement efforts have on IT professional motivation in higher education. It is quite clear that both of these areas have a direct positive impact on the motivation of IT professionals working in higher education. Sam stated that "empowering the faculty" is one of the best aspects of working in higher education. Sam also shared that "helping people with new technology" and helping them be "more efficient at their work and collaboration" are other motivational benefits to working in higher education. Kris shared that

"being able to offer that to students, the flexibility that they can work from home on this stuff is awesome." Bobby stated that, "To feel like you're solving problems and you're allowing your users to go about a service that they pay for. I think that's motivating." While IT professionals working in higher education find it motivating to provide great service and useful technologies to students and faculty, they find little opportunity to directly engage with these stakeholders, to better understand their needs, and to gain direct feedback on the services in which they provide and support. "Honestly, I can't tell you the last time I was directly involved with a student" shared Bobby. When asked about working with faculty and students, Sam shared, "Typically, I don't. I work more with the administrative stuff." He also shared that he is trying to hire more student workers that "would help communicate what IT does to the students and how we can get feedback from them." Kris shared that, "The only time I spend a lot of time with faculty is if we're meeting with a committee that faculty are on." While there are many motivational benefits to working with the administrative staff, such as finding efficiencies in processes and tools and helping to implement new technologies, the amount of time spent on and with the administrative staff appears to be quite disproportionate in comparison to the time spent with faculty and students. One method for providing opportunities to engage with faculty and students could be to hold focus groups around major IT projects or changes to student or faculty-facing systems to gather additional input and perspective from this group of constituents. This would also provide faculty members and students an opportunity make a connection between the different services and projects, and the IT professionals doing the work behind the scenes.

Institutional Mission Disconnect. The mission statements from the participating institutions, as well as the mission statements of the IT organizations of those institutions, all share similar sentiments. They speak about preparing students, promoting innovation that

enhances student learning, and being student-focused. Yet this appears to be the group of constituents with whom IT spends the least amount of time. Kris had shared some frustrations on university leadership's lack of consideration for faculty and students, stating that, "I don't think it's a big consideration a lot of the times, honestly." He then goes on the share that, "They didn't really care about our current population of students and we had to, honestly, fight with them to get links to IT services that students and faculty use all the time in the header of our website." Developing and implementing technological solutions for students and faculty can be a positive motivator, as this study has shown. While it has also shown that solutions and work around operational efficiencies can also be a positive motivator, there appears to be a disproportionate amount of resources allocated to the administrative functions of the university, which in turn, can adversely affect motivation. This is in line with the findings of Leidner and Kayworth (2006), who found that institutions that place a higher value on process than people may invest more heavily on technology to enhance or increase business processes. University leaders and IT managers should consider ways in which IT can engage directly with faculty and staff more often. Institutions that have a center for teaching and learning, or a similar department dedicated to helping faculty could look to partner with IT. Rather than having only departmental staff hold trainings on specific technologies, the IT professionals responsible for those technologies could be asked to join and share additional background information on unique features of that institution's setup of the technology, or share useful tips and tricks. The use of surveys to gather the thoughts and opinions of faculty and students could be another option for university leadership. While these should look to evaluate the current technologies in place, they should also provide opportunities to share ideas and use cases that highlight the current needs of students and faculty, from their point of view. Sam suggested looking at student workers to help

gain insight into the needs of students. This could certainly be beneficial, but only if their suggestions and opinions are actually solicited and truly considered. Leadership should also reconsider how work is prioritized in terms of university goals. As discussed earlier, there appears to be somewhat of a disconnect in the mission of the institutions, and the work that IT departments are charged to perform.

Communication

Twine and Brown (2011) shared that real-time collaboration and communication tools such as WebEx and Skype can assist in eliminating the space barriers when used by administrators for meetings and trainings. Schaffhauser (2008) found that utilizing Voice over IP can provide university stakeholders another way to communicate while reducing operational costs. Each participant discussed all these methods, as well as expressed his or her preference for each, which might be different based upon those in which they are speaking. Many participants stated that they prefer a technology-based method for communicating with their peers but preferred face-to-face conversations with those outside of their department. The commonality among all the responses, however, resides in the participant's desire to fully understand the problems and where the stakeholders are coming from. To address the many ways in which IT professionals prefer to communicate, institutions should invest in tools that allow multiple forms or communication. As Dumont (2011) stated, email must not be the only communication method that IT staff use with their constituents. Tools such as Slack or Microsoft Teams allow both functional and cross-functional teams to separate out digital conversations by topic, which can be saved and searched, and utilized in both a synchronous and asynchronous manner. Tools like WebEx and Skype can be utilized and integrated into other tools to allow both video and voice conversations with one or many individuals simultaneously. Providing or supporting only a

single method of communication will not allow IT professionals the flexibility to communicate in a manner in which he or she is comfortable or effective.

The placement of various IT functional areas on campus tend to be an afterthought at many institutions. Not only can this be bad for employee morale, but it can exacerbate the negative impact the siloed structure has on internal communication and collaboration. As Cois, Yankel, and Connell (2014) found, little interaction between the various groups can lead to increased latency when tasks or projects cross boundaries, difficulties in communication, and in turn, negatively impact the organization. This was also something that was found to be true in this study. Participants shared that the different functional areas don't always collaborate well together, partly due to the siloed structure of the organization. Bobby shared that, "up until maybe four years ago, when we started that shift to managed hosting, even our factions were siloed. We would interact when we had to interact." Alex shared that the silos don't allow the different groups inside of IT to communicate as well as they should. Two of the participants from different institutions shared that most of IT are in the same location, and both stated that everyone in the department gets along well with one another. Instead of being an afterthought and dispersed to various parts of the campus, university leaders should consider keeping the IT professionals together in a single location. As stated by Cois, Yankel and Connell (2014), tighter collaboration and integration of the different IT teams helps to maximize both the quality of the software and the productivity of the organization. Having IT in a single location would allow for better collaboration among the different functional areas and would provide those who wish to speak with his or her peers more opportunities to do so. As Bobby suggested, this would allow for "understanding the person, and not just the name on the other side of that monitor."

Retention and Hiring Practices

As stated by Holmes (2006), the retention of qualified IT professionals is at an all-time low within educational institutions, creating both resource and budgetary constraints on the institution, yet retaining highly skilled, qualified IT professionals is essential for the success of any institution. Several researchers all found all found that compensation is an important factor in an IT employee's decision to remain with their employer (Davis, 2013; Abii, Ogula, & Rose, 2013; Holmes, 2006). The findings of this study strengthen those of existing literature, with participants sharing that salary is one of the largest drawbacks to working in higher education. As Kris shared, it's hard for IT professionals to ignore the offers constantly placed in front of them from places like LinkedIn where jobs for which they are qualified pay significantly higher. It may be helpful for human resource departments as well as hiring managers to conduct periodic market research to better understand the current salaries for the various types of IT work being performed on campus. While there are many factors that go into the posted salary for IT positions within higher education, such as institutional location and cost of living in the area, universities need to consider options for shrinking the wage gap as much as possible to draw stronger applicant pools and assist those who accept in ignoring the barrage of offers from social networking sites. One potential option for universities that comes from this study is to consider existing tuition benefits afforded to IT professionals and how those might be increased to help compensate for the gap in wages compared to the private sector. Participants shared that while they may not use the benefits themselves, having it available for their dependents is a huge benefit. While not everyone shared the details of his or her institution's tuition benefit, this information could be easily ascertained on all but one of the institutions' websites. Two of the institutions offered unlimited undergraduate credits for employees as well as their dependents.

One institution offers employees a significant discount, as well as a 50 percent discount on tuition for dependents. Two of the participant institutions cap the number of credits an employee can take per semester or fiscal year, but at no cost for those credits. Institutions that do not offer any tuition assistance, or that offer only marginal assistance to employees or employee dependents, should consider re-assessing this benefit, as this study has found it to be a benefit that IT professionals working in higher education appreciate, and might help reduce IT turnover.

Another benefit to working in higher education shared by participants was empowering faculty and students and helping others with technology. While examining current job postings for IT positions in higher education, there was no mention of this aspect on any of the postings. One thing institutions could do is to add statements to the postings expressing the importance of the position in terms of helping faculty and students succeed, rather than focusing simply on the technical aspects of the position. Highlighting the importance that the position has on teaching and learning might help draw candidates with whom this speaks, such as those who chose to participate in this study, with adding only minimal costs to the recruitment efforts.

Understanding, Appreciation, and Partnership

As previously mentioned, despite all efforts to ensure the critical resources that students, faculty, and staff rely upon to be successful are available and optimal, IT professionals working in higher education often feel underappreciated and undervalued. Participants shared that they feel like they are only brought in when it is time for implementation and told to “make it work,” rather than being brought in at the beginning to help develop a solution. They shared that they feel they are not even considered until something goes wrong. According to the Hanover Research 2017 industry trend report for higher education, total enrollment in U.S postsecondary education continues to decline, forcing many institutions to reevaluate academic program

offerings, or experiment with alternative delivery formats. These external pressures might be contributing to the lack of collaboration between administrators and their IT departments, with administrators focusing the majority of their attention to these external factors and paying less attention to the internal workings and needs of the IT department or ensuring their involvement in strategic decisions, exacerbating the challenges faced by the IT departments. It is quite clear, however, that the IT professionals who work in higher education want to help. They want to be seen. They want to share their expertise and help design solutions that will benefit everyone at the institution. They don't want to be an afterthought. This might also lessen the overall work required by IT professionals. Instead of having to spend extra time figuring out how to work around the decisions and implementations that do not solve the problem at hand, having IT be involved in the design could allow things to be done correctly the first time with less effort. Harrold (1988) stated that IT professionals have a low need for social interaction. While this study does not provide any insight into IT professionals working in the private sector, the findings of the current study do not align with this assertion. When considering the discussion around communication, the participants clearly articulated that they truly want to understand the problems each stakeholder is having. To accomplish this, they need to interact with them. While the form of the interaction may vary among the participants, all wanted to interact with the stakeholders to better understand the problem and help them in any way they can. Casey, who was very open about his struggles with social interactions, shared how he believes it is important for IT professionals to make an effort, not only to provide a better service, but to help ensure future career opportunities:

> So, I think it's important, especially for people like me, that aren't well versed in all that interpersonal stuff, to make an effort, to at least get a working knowledge and try and

> sympathize with people a little bit. Because if you're just a technical genius in IT, you will still be hamstrung in your career by a lot lack of interpersonal skills and it is important. No matter how much you think you work with computers and not people, you gotta do both. No matter what the job is.

While IT professionals need time and space to work on issues and projects, there still exists the desire to work with others. A desire to be included in the conversations and planning. A desire to ensure sure the faculty, students, and staff have the tools they need to be successful. As previously discussed, partnering with centers for teaching and learning and utilizing surveys and focus groups could help IT professionals focus on the specific needs of the students and faculty, and provide opportunities for direct interaction.

The Ones Behind the Curtain. One cause for this misunderstanding of IT professionals working in higher education comes from a lack of transparency into the work they do. One participant shared an anecdote about not being able to help someone with their email problem because a server is literally on fire. While certainly extreme, it does highlight this problem. Casey, while speaking about the importance of a service he supports shared, “That definitely directly and positively impacts the students. Or negatively if I screw it up. But definitely directly impacts that, even if they don't know that I'm the one behind the curtain.” This lack of transparency does a disservice to the organization, and can contribute to the de-motivation of those supporting the university’s critical resources. Many of the participants spoke about their institution utilizing a ticketing system for students, faculty, and staff to submit service or help requests. A ticket comes in, and the IT professional that takes it reaches out to the individual and works to solve the problem, or provides them the service that was requested. A problem with this is that the only thing the requestor knows is that someone in IT is helping them. They may or

may not know that the person with whom they are interacting had been assigned their particular ticket because it falls into their area of expertise. They also may or may not have any insight into the number of other tickets that are waiting on someone from IT to work on, or the multitude of projects that are not represented by specific requests. These could be projects to upgrade core systems, implement new services, or even to address technical debt from past projects where a quick fix was necessary and the time had yet to be taken to circle back around and address the problem appropriately. Providing some transparency into the type, and amount of work that the information technology department is currently tasked would be very beneficial to both IT professionals and university stakeholders (Enns, Ferratt, & Prasad, 2006). Students, faculty, and staff would be able to see the amount of work currently waiting on IT, highlighting the importance of the services being offered and helping to make a connection between these services and the effort and expertise it takes to offer them. This would assist in setting realistic expectations and would allow stakeholders to view larger issues that may be impacting them as well. This would also provide both IT and other university stakeholders an opportunity to evaluate how current projects align with the larger university goals and to identify anything that might be overlapping with ongoing projects to save on duplicating efforts. This might also help address the stereotype of every IT professional knowing everything about IT. By displaying the differentiation of IT services and to which functional roles those are aligned, university stakeholders might begin to realize that the field of information technology is quite broad and that IT professionals are typically subject matter experts in only a subset of areas.

Another opportunity for allowing university stakeholders to better understand IT professionals and the work they perform on behalf of the institution could be an annual “Getting to know your IT department” conference. Areas could be designated for the different functional

roles, such as networking or development, where IT professionals for those areas could talk to stakeholders and share more about themselves, what they do, and perhaps even share best practices for the technologies and services their area offers. This could be another way to allow faculty, students, and administrators to better understand the services that the university provides, and the resources it requires to operate and support those services.

Partnering with IT. Technology has become a critical component in today's academic institutions. Students depend on technology in many aspects of their academic experience. From registering for courses, paying their tuition bills, accessing course content from anywhere on the globe 24 hours a day, to completing assignments, conducting research, collaborate with peers, and purchasing merchandise at campus bookstores and sporting events. Faculty depend on technology to facilitate courses, both online and in traditional classrooms. They depend on technology to conduct institutional research and to protect the data that are collected. They depend on technology to carry out complicated simulations using high-computing research clusters. To collaborate with colleagues both in their own institution and across the industry. To assist and mentor students from all over the world. Administrative staff depend on technology to provide support services for all university stakeholders. They depend on technology to keep the institution operating efficiently and effectively. All this is happening in a time where state appropriations are dwindling and the need to ensure students have access to higher education is simultaneously increasing. A time where institutions are being asked to keep tuition costs down, and at the same time, offer more and greater services. To conduct more research. To offer more programs. To meet graduation goals. The list seems never-ending. Faculty and staff depend on technology to accomplish these tasks. It is the job of IT professionals to design, implement, and support the critical technologies that all university stakeholders rely upon. A group of people that

are absolutely critical to the success of the organization, but one that is often misunderstood, underutilized, and underappreciated.

As institutions of higher education continue into the digital age and continue to become increasingly dependent upon technology, it is imperative that they look to partner with the IT professionals who are subject matter experts in their area and who have chosen to work for their institution. As Leidner and Kayworth (2006) pointed out, not only do different types of technological artifacts influence certain cultural values, but IT has the potential to assist in organizational culture re-engineering efforts. As this study demonstrates, IT professionals who work in higher education are motivated by helping solve these complex problems. They want to be included in the conversations around strategic initiatives. They enjoy finding ways to improve the services that faculty, staff, and students use on a daily basis. Instead of ignoring IT professionals until it is time to implement a solution, only to find out that the solution may not be what is best for the institution from a technical perspective, or incompatible with existing architecture, institutional leaders, as well as faculty, need to consider bringing in IT at the beginning of these discussions.

As previously mentioned, external pressures and variables such as state appropriation adjustments, declining enrollment, and government mandates can have a tremendous impact on the institution, and impacts on the institution will have impacts on the IT professionals. This might include being too focused on the larger problems, and forgetting about the resources already available in their IT department. IT representatives should be included in discussions around the current challenges and problems that include representatives from IT. Often times there are already solutions in place that are not being fully utilized that might help solve the problems institutions are facing. This can be especially true when considering the problems and

challenges of individual colleges or department within the institution. IT may have already solved the same problem for a different area of the institution, and rather than ignoring IT and trying to solve the problem within the department or college, working with IT would save time and money and provide a quicker implementation with an existing solution. It would be impractical to invite IT to every departmental meeting, but in much the same manner as highlighting the existing IT work, departments and colleges can be transparent with the challenges they are currently facing. Having this information available would allow IT professionals to be proactive and reach out to the various areas to share what solutions are already available, or to share their expertise and suggestions on potential avenues to solve their problems. This could be accomplished over many different channels, such as departmental news feeds, Yammer groups, or even periodic face-to-face meetings. This two-way communication could go a long way in minimizing duplicate efforts in solving similar problems across the organization, utilizing existing technological and process expertise, and reinforcing the positive motivators for IT professionals in helping to solve complex problems.

IT professionals help to ensure the confidentiality, integrity, and availability of the systems that students, faculty, and staff depend upon. They enjoy the challenges of the ever-changing field of technology and empowering faculty, students, and staff by providing technology and infrastructure that is reliable and secure. It is time that educational leaders strive to better understand and partner with the stewards of the resources in which the university so heavily relies. To do this, educational leaders will need to influence the overall organizational culture to better align with the needs and values of the IT professionals who have chosen to work in higher education (Privateer, 1999). To help shift the views of information technology departments and IT professionals from merely utilities, to strategic partners in the mission of the

institution. Academic leaders will need to work with the various constituencies in fostering a culture that embraces the expertise and knowledge of the IT professionals employed by the institution, and creates motivating opportunities for IT professionals to utilize their skills to assist in solving the challenges faced by the various departments and the institution as a whole. Helping to break down the communication silos not only within the IT organization, but across the entire institution. Working towards dismantling IT stereotypes by better highlighting the work IT performs and its importance on the organization, and helping to put names and faces to the services that students, faculty, and staff rely upon. In doing so, the institution can create a work environment suitable for the needs of IT professionals, greatly reduce the risk of costly IT turnover, and better utilize the knowledge and expertise of those hired to ensure the confidentiality, integrity, and availability of the systems that students, faculty, and staff depend upon.

Recommendations for Future Research

The purpose of this phenomenological study was to explore the essence of being an IT professional working in higher education. The population for this study was limited to information technology professionals currently employed directly by four-year degree-granting institution' office of information technology located in the State of Michigan. Future research using the same semi-structured interview protocol could be conducted with community colleges or other types of institutions. In the state of Michigan, there are community colleges with as large, or larger student populations as that of the four-year institutions that were a part of this study. Comparing the findings to that of this study could provide additional insight into the IT professionals working in higher education, beyond the sample contained within this study. This study could also be replicated and expanded to include institutions across the Midwest United

States, rather than just those in the state of Michigan. Insights gathered from the expansion of population could help identify technical and cultural difference that might be useful in recruitment and retention efforts. Another limitation of this study was that it did not include those in leadership positions within the information technology organization. Replicating this study to investigate the essence of being an IT professional in a formal, advanced leadership position in higher education could provide additional insights in the cultural and motivational aspects of the rest of the IT workforce. Another area for future research would be those IT professionals who work in the distributed areas of the institution. Many institutions are highly segmented, with individual colleges within the institution having their own IT professions, who utilize centralized services, but are not part of the centralized IT organization. These IT professionals might interact differently with the various institutional stakeholders, compared to those in the centralized part of the organization. Using the same approach taken in this study to examine this group of IT professionals could provide additional insight for IT and executive leadership. Finally, future research could be conducted around those in help desk or service desk roles in higher education. In many organizations, first-level help or service desk workers are often new to the profession, or they might be student workers. There are, however, full-time IT professionals in these areas who often act as a point of escalation. While this group of IT professionals are not typically involved in the development, installation, or maintenance of core applications and systems, they do spend significant time assisting faculty and students with technology-related issues.

Conclusion

Technology has become a critical component in today's academic institutions. It is the job of IT professionals to design, implement, and support the critical technologies that all university stakeholders rely upon. A group of people that are absolutely critical to the success of the organization, but one that is often misunderstood, underutilized, and underappreciated. IT professionals spend an extraordinary amount of time monitoring critical sources to ensure the confidentiality, integrity, and availability of the systems on which faculty, staff, and students rely. System issues and service requests are addressed expeditiously as possible, while simultaneously working on projects for many areas on campus. IT professionals often feel they are ignored on institutional initiatives until implementation time, where university leaders task them with making it work, rather than utilizing their expertise during the planning processes. When IT professionals do find a way to make it work, recognition for a job well done can be found with direct supervisors, but rarely by the department or institution. Communication is done through many forms, but always with a desire to fully understand the problems and where the stakeholders are coming from. The siloed structure of the IT organization adds a challenge in collaborating with peers in different areas, which are often broken up by function. Despite being broken up by functional domain, those outside of IT often hold to the stereotype that all IT Professionals know everything about all aspects of technology, which is frustrating for IT Professionals. Despite feeling under-appreciated and misunderstood, IT Professionals working in higher education enjoy the challenges of the ever-changing field of technology and empowering faculty, students, and staff by providing technology and infrastructure that is reliable and secure.

In understanding that IT professionals appreciate challenging work and solving complex problems, leadership can use this knowledge to formulate better strategies for solution design

activities around university problems. Leadership should also be open-minded when it comes to change and should lean on the expertise of IT professionals to thoroughly understand the impact to the organization. University leaders and IT managers should consider ways in which IT can engage directly with faculty and staff more often, as developing and implementing technological solutions for students and faculty can be a positive motivator for IT professionals.

The placement of various IT functional areas on campus tend to be an afterthought at many institutions, harming employee morale and exacerbating the negative impact the siloed structure has on internal communication and collaboration. University leaders should consider keeping the IT professionals together in a single location, allowing for better collaboration and maximizing productivity. University leaders should consider highlighting the importance that the position has on teaching and learning during job postings, which might help draw candidates to whom this speaks, such as those who chose to participate in this study, while adding only minimal costs to the recruitment efforts. Considerations should also be given to expanding tuition benefits afforded to employees and their dependents to help compensate for the gap in salary compared to other industries.

Another consideration for universities is to be more transparent when it comes to the work in which IT professionals are tasked. Providing transparency into the type and amount of work that the information technology department is currently tasked could help in setting realistic expectations, provide opportunities to evaluate projects and their potential impact on larger institutional goals, and provide opportunities to celebrate IT successes.

As institutions of higher education continue into the digital age and continue to become increasingly dependent upon technology, it is imperative that they look to partner with the IT professionals who are subject matter experts in their area and who have chosen to work for their

institution. IT professionals enjoy the challenges of the ever-changing field of technology and empowering faculty, students, and staff by providing technology and infrastructure that is reliable and secure. It is time that educational leaders strive to better understand and partner with the stewards of the resources on which the university so heavily relies.

APPENDICES

APPENDIX A

.NET Web Developer
Wolverine Technical Staffing, Inc, Farmington Hills, MI

Full Time

Job Description:

We are currently recruiting for a Web Developer (.NET) to join our team in Farmington Hills, MI. This is a fantastic opportunity for an experienced .NET Developer to join a stable company with fantastic benefits.
Position Summary
Provides and/or facilitates the planning, analysis, design, development, implementation, and maintenance of software applications.

Responsibilities

- Participate in the requirements gathering phase, design and preparation of specifications for new projects and/or existing systems.
- Work with other Application Development team members to estimate, plan and schedule tasks to meet assigned target dates.
- Document new and existing systems, develop workflows, and create other supporting documents in adherence to all departmental and corporate standards.
- Obtain approvals and consult with production control as needed to prepare programs/systems for implementation; correspond with clients to implement operations programs/enhancements and identify/resolve problems.
- Review completed code, documentation and other deliverables to ensure that they meet specifications and requirements based on defined expectations.

Requirements

- Bachelor's degree in Business, Computer Science, Engineering or related field.
- 3 years application development experience.
- Insurance or financial services industry experience is a plus.
- Demonstrated successful experience and knowledge of one or more web software development platforms, tools and database management systems including Microsoft .NET, MVC, Web Forms, C#, SQL Server and Oracle.
- Demonstrated successful experience in one or more systems development life cycle (SDLC) methodologies, including those that support agile / iterative development.
- Demonstrated working knowledge of data structure and database concepts and practices.
- Proficient computer skills required including Microsoft Office Suite.
- Demonstrated successful ability to build positive relationships and partnerships within department, across the organization and with external customers.
- Excellent organizational skills and ability to function in a fast paced, highly visible, and changing environment.
- Excellent verbal and written communication skills with the ability to interact with internal and external customers.

Please refer to job #339 in your response and send your resume in MS Word format.

https://www.dice.com/jobs/detail/.NET-Web-Developer-Wolverine-Technical-Staffing%2C-Inc-Farmington-Hills-MI-48331/wolverin/339?icid=sr62-3p&q=Web%20development&l=MI

APPENDIX B

Network and Telecom Architect
e-IT Professionals Corp., Flint, MI
Duration: Full Time

JOB SUMMARY
The Network & Telecom Architect will have the opportunity to lead the design, implementation, and transition to operational support the latest in switching, routing and VOIP technologies within world class datacenters. This position requires in depth experience and familiarity with Cisco routing/switching hardware and software along with demonstrating a firm understanding of TCP/IP routing and switching principles, and VOIP telephony system design and administration. You will be partnering with internal business units to design and implement technical solutions that exceed expectations while keeping within defined budgetary constraints. A successful Network & Telecom Architect must show they are driven to explore and understand new technologies, establish multi-year technical roadmaps, and apply them to solutions that can meet the business needs. Additionally, a candidate must possess the organizational skills to excel on multiple projects with competing priorities. This individual will also serve as a subject matter expert to the production support Network and Telecom team to assist in analyzing and resolve network hardware and software problems in a timely and accurate fashion.

• This position reports to the Director of Architecture and Planning
• There are no direct reports to this position
• Education: Bachelor's Degree in Computer Science or related Information Technology field required. Relevant experience may substitute for the degree requirement on a year for year basis.
• Licensing/Certification: CCNP certification required, CCIE preferred
• Experience: 10+ years prior experience in Architecting and implementing Cisco switching, routing, security, firewalls, load balancer, wireless RF, and telephony solutions.
• Skills/Knowledge:
o Expert-level knowledge and experience with Cisco switching, routing, Cisco UCS environment, ASA Firewall, ACE Load Balancer, and WLAN controllers.
o Proven expert experience and success with LAN, WAN, and WLAN, design and implementation.
o Proven expert experience with network capacity planning, network security principles, and general network management best practices.
o Excellent, hands-on technical knowledge of network, intrusion protection/detection and security systems.
o Excellent knowledge of telephony systems.
o Share technical expertise, providing technical mentorship and cross-training to peers, serving as an example to other team members.
o Extensive technical knowledge of current network hardware, protocols, and Internet standards.
o Excellent hardware troubleshooting experience.
o Competence with testing tools and procedures for voice and data circuits.
o Knowledge of applicable data privacy practices and laws.

o Given that this position physically interfaces with the customer, a professional, courteous demeanor is required in all circumstances.
o Must possess excellent communication skills including verbal, written, and telephone etiquette.
o Ability to interpret, analyze, troubleshoot and resolve technical problems
o Organizational, fact-finding skills and problem solving skills are required.
o Must be decisive, conscientious and interact well in a team environment
o Must be detail-oriented and able to multi-task and meet deadlines in a fast-paced environment.
o Must have a strong working knowledge of and experience with computer hardware, software and peripheral devices in a diverse environment
o Be able to work well with various personalities and work as a team.
o Should be organized and able to prioritize and manage time effectively.
o Must be dependable and able to act with discretion maintaining levels of strict confidentiality.
o Provide professional and personal assistance to clients in answering inquiries, locating information and analyzing technical requirements.
o Provide prompt responses to users for problem resolution.
• Physical: Sitting for prolonged periods of time at a desk, walking, standing, bending, crouching, and capable of lifting up to 50 pounds.
• Mental: Basic math skills and computer aptitude.
• Language: Fluency in English with outgoing personality that translates to phone skills with excellent verbal and written communication skills.
• Reasoning: Ability to apply common sense understanding to carry out instructions furnished in written, oral, or diagram form.

WORKING CONDITIONS

Variable in a climate controlled office environment.

DUTIES & RESPONSIBILITIES

• Design, conceptualize, perform project management, configure and assist with installation of Cisco Nexus 5K, 7K, UCS environment including 6248 Fabric Interconnect, UCS Manager, 3750x Access Switches, Routers, ASA Firewalls, Cisco WLC, Cisco APs, Cisco CUCM, UCCX, Unity, Telephony Gateways, NextGen Firewalls, Forescout IDS/IDP detection systems, installation of needed peripherals and software, and physical attachment of PC to network.
• Design, configure, and assist with Install, maintain and troubleshoot Network Infrastructure equipment, PCs, printers, phones and other peripheral equipment.
• Ensure system security in compliance with policy including virus protection
• Utilize tools such as Wireshark, Cisco Works, Putty, ManageEngine
• Follow standard software installation procedures and install a variety of software packages
• Research impact and design implementation plan for OS and software updates as needed
• Maintain software and hardware inventories
• Assist with equipment replacement cycle
• Prepare and maintain appropriate written documentation for procedures, systems, and infrastructure
• Responsible for Solutioning and implementing new technology solutions.
• Maintain an awareness of trends within the technology industry
• Maintain a neat and organized workspace.
• Other Duties and Responsibilities as assigned.

MEASUREMENTS OF PERFORMANCE

• Attendance and punctuality.
• Weekly status reports
• Working efficiently without creating distraction or disruption to other employees keeping personal conversations to a minimum.
• Compliance with company policies and procedures.
• Accurate and swift productivity. Must be able to set priorities effectively.
• Successful achievement of and growth in the completion of designated Duties and Responsibilities.
• Ability to maintain professional and friendly appearance and atmosphere.
• Developing and demonstrating teamwork and cooperation with co-workers.
• Maintain levels of confidentiality in all areas of the job.
• The morale and spirit within the department is maintained including the degree of cooperation, communication, and coordination between employees and the degree of success in solving problems.

Employees are responsible and accountable for:

• Compliance with workplace policies and procedures for risk identification, risk assessment and risk control.
• Active participation in activities associates with the management of workplace health and safety.
• Identification and reporting of health and safety risks, accidents, incidents, injuries and property damage at the workplace.

This job description has been designed to indicate the general nature and level of work performed by employees within this classification. It is not designed to contain or be interpreted as a comprehensive inventory of all duties, responsibilities and qualifications required of employees assigned to the role.

ABOUT US:

EIT IS A CONSULTING, IT RECRUITMENT MANAGEMENT AND STAFFING ORGANIZATION

E-IT Professionals Corp. (EIT) **was** founded in 1999 as an Information Technology Staffing and IT services company in the State of Michigan.

Our core strengths are Exceptional People, Quality Processes and Client Value Creation along with long term Partnerships.

Our clients view us as partners. We are as committed to their **business** success as they are.

At EIT, we believe our value is based on our distinctiveness, Integrity and culture.

We Present Quality and Professional Consultants committed to build long term relationships.

https://www.dice.com/jobs/detail/Network-and-Telecom-Architect-e%26%2345IT-Professionals-Corp.-Flint-MI-48501/10124157/NTEASAT?icid=sr6-1p&q=Telecommunications%20Technician&l=MI

APPENDIX C

Software Developer IV
Cengage Learning, Farmington, MI

Full Time

Job Description:
The Content Engineering team is responsible for defining data structures, metadata models and content workflows for Cengage's web applications. This team ensures that content meets product and platform requirements in support of student and library patron learning and research.

The Software Development IV role will be in support of critical internal systems that support delivery of content and metadata to customer-facing applications.

This role will be directly responsible for enhancing and maintaining core content systems, providing strategic technical direction for these systems, and guiding a team in disciplined software development.

Responsibilities:

* Help break down, estimate and provide just-in-time design for small increments of software development work.
* Ensure that completed work is accomplished with well designed, testable, efficient code.
* Perform root cause analysis, technology evaluation and design spikes.
* Get things done. Commit to completing well-defined work, and deliver on those commitments.
* Build a strong team through collaboration and modeling of courageous, continuous learning.
* Promote improvements in version control, continuous integration, project build and project automation.
* Report status of assigned software development and/or maintenance tasks, and participate or lead weekly demonstrations of recently completed work.

Qualifications:

Required Skills and Education:

1. Bachelor's Degree in Computer Science / Computer Engineering or equivalent
2. Knowledge of, and desire to work in, an Agile development environment.
3. Familiarity with wide portfolio of software development applications, environments and languages
4. Experience using continuous integration and source code control systems, such as Jenkins, Maven, Git, Subversion and/or CVS
5. Knowledge of XML parsing and DOM traversal

6. Experience with a variety of database systems, such as LDAP, Oracle, Sybase, MongoDB, MarkLogic/NoSQL
7. Ability to research and resolve complex programming issues and to propose strategic technical goals in support of system maintenance and enhancements
8. Possess strong leadership and problem solving skills, a good work ethic, and a strong teamwork orientation.
9. Sensitivity to cultural differences in interactions and in the way work is done

Desired skills:

1. Advanced degree preferred
2. Minimum 7 years' software development experience, including 4 years of combined Java and/or JavaScript programming
3. Passion for working in the academic, professional or library markets, and experience with those markets' technologies such as LMS, eReaders, OPAC, OpenURL, Z39.50, SRU/SRW, KBART
4. Strong familiarity with object-oriented systems and enterprise design patterns
5. Experience with development of service-oriented applications
6. Deep understanding of HTTP/REST/API architecture
7. Familiarity with VB, C, C++ and PERL
8. Creative problem solving skills and a strong teamwork orientation.
9. Stays abreast of industry trends, technology trends, language trends, process trends. Brings new ideas to the team. Ideally also participates in open source projects and/or blogs about technology concerns.

May require up to 10% travel, including international travel.

https://www.dice.com/jobs/detail/Software-Developer-IV-Cengage-Learning-Farmington-MI-48331/10319575/1551?icid=sr88-3p&q=Application%20development&l=MI

APPENDIX D

System Administrator
ITC Holdings Corp, Novi, MI

Full Time

Job Description:
Provides support for application software, operating systems, computer hardware and associated networks for the 24 x 7 operation of specialized computer systems in a leading electric transmission company.

ESSENTIAL DUTIES AND RESPONSIBILITIES

- Performs operating system installations and administration.
- Monitors system stability and performance.
- Performs operating system tuning/optimization.
- Performs periodic maintenance, debugs and repairs user and client systems software and hardware (physical and virtual).
- Provides support for proprietary database changes and post processing.
- Performs the management, configuration and testing of hardware and software in compliance with regulatory requirements.
- Implements software changes and patches, working with software vendors and contractors, as required.
- Performs hardware changes and repairs, working with hardware vendors and contractors, as required.
- Supports malware, anti-virus and other security facilities.
- Participates in the team rotation of 24/7 support to troubleshoot and resolve critical hardware and software issues by working with customers, contractors and system vendors, as required.
- Communicates with managers and user groups to provide status updates, input and alternatives for processes, security considerations and infrastructure impacts and requirements.

REQUIREMENTS

- Bachelor’s degree in Engineering, Computer Science or Computer Information Systems with a minimum of three (3) years of professional application administration experience, including experience in targeted high availability environments, as identified in job posting supplement, or relevant, equivalent experience and/or education.
- Must possess sound analytical, problem-solving and documentation skills.
- Functional knowledge of application/system administration facilities, as identified in job posting supplement.
- Functional knowledge of computer operating systems used in targeted environment, as identified in job posting supplement.
- Strong verbal and written communication skills.
- Ability to multi-task and work with minimal supervision

Supplement: Additional Responsibilities and Qualifications for Job Posting
IT Services:
Environment: Windows 7 or higher; Windows Server 2008 R2 or higher, Linux
Tools: Windows Server Update Services (WSUS), Active Directory, Domain Name Services (DNS),
Applications: SharePoint; Exchange; NearPoint; Websense; VMWare; Lync, MS SQL, MS SCCM, Apache, IIS, Citrix, Symantec, Powershell, Office 365
Infrastructure: Windows; VMWare, Linux
Databases: MS SQL, Exchange Information Stores, MySQL, Oracle
Hardware: Cisco, Dell, EMC, HP, IBM, Blade Chassis, SAN,
Compliance: Provides infrastructure support for the corporate security programs and complies with all relevant regulations associated with NERC Critical
Infrastructure Protection (CIP) and Sarbanes Oxley

https://www.dice.com/jobs/detail/System-Administrator-ITC-Holdings-Corp.-Novi-MI-48377/RTX1560a5/419973?icid=sr3-1p&q=Systems%20Administrator&l=MI

APPENDIX E
SEMI-STRUCTURED INTERVIEW PROTOCOL

1. Greeting and introduction
2. Explanation and review of study
3. Expectations of interview
4. Consent form
    a. Review confidentiality
5. Interview
    a. Consent for recording
    b. Interview questions
    c. Questions from participant
    d. Follow-up intentions for member checking

Interview Questions

TECHOLOGY

- What led you into the field of technology?
- What are your technology-related hobbies?
- What do you feel are your strongest technological skills?
- What do you feel are your weakest technological skills?
- What do you feel are the benefits of working in IT?
- How much time do you spend experimenting with or learning new technology at work?

CULTURE

- How would you describe the culture of the college/university?
- How would you describe the culture of your IT department?
- How well do those in your department interact with one another?
- How do you feel you are stereotyped as an IT professional?

MOTIVATION

- What aspects of your job are the most motivating?
- What aspects of your job are the least motivating?
- What do you feel are the best aspects of working in higher education?
- What drawbacks do you feel there are in choosing to work in higher education?

STUDENT LEARNING

- How do you feel the work you perform impacts your students?
- What role do you feel your education has played in your success?
- In what ways do you feel student success impacts the decisions you make in fulfilling your duties?
- How much time do you spend working directly with students?
- How much time do you spend working directly with faculty?

OPERATIONAL EFFECTIVENESS

- How do you feel the work you perform impacts the effectiveness of faculty in their teaching roles?
- How you feel the work you perform impacts the effectiveness of staff and administrators?
- How much time do you spend working directly with staff members?

APPENDIX F
INFORMED CONSENT FORM

CMU
CENTRAL MICHIGAN UNIVERSITY

Adult Consent Form

Study Title: The ones behind the curtain: A qualitative study of IT professionals working in higher education

Student's Name and Department: Jerald Todd – Educational Leadership
Instructor's Name and Department: Dr. Benjamin Jankens – Educational Leadership

Introductory Statement

My name is Jerald (Jerry) Todd and I am a doctoral candidate at Central Michigan University conducting research in fulfillment of the Doctor of Education degree in Educational Leadership. I would like to invite you to participate in this study, in which the details can be found in this consent form. I am available to answer any questions you might have in regards to this study or your participation using the contact information below:

Contact information:
Jerald Todd
todd1jw@cmich.edu
989-615-1253

What is the purpose of this study?
The purpose of this study is to explore what it means to be an IT Professional working in higher education. Examining this group of individuals and their lived experiences as IT professionals working in higher education might allow educational leaders to better understand the needs of IT professionals, how best to interact and motivate them, or to develop or modify proper recruitment and retention strategies to hire and retain this highly skilled group of employees and help ensure organizational goals can be accomplished.

What will I do in this study?
You are eligible to participate in this study as you are an IT professional who has worked in a four-year, degree-granting institution in the state of Michigan for at least the past two years. If you decide to participate in this research project, I will go over this consent form, ask for your

permission to be record the interview, and then walk through a series of interview questions regarding your experiences of working in higher education as an IT Professional.

If you give permission for the interview to be recorded, please sign here:

_____

Alternative: If you do not wish the interview to be taped, please sign here:

_____

How long will it take me to do this?
It is estimated that that the interview will take approximately 90 minutes to complete.

Are there any risks of participating in the study?
There are no anticipated risks or discomforts as a result of participating in this study.

What are the benefits of participating in the study?
Participants will be reflecting on their lived experiences as IT professionals working in higher education. Such reflection may be helpful in recognizing areas in which modifications could be made to allow for additional success in their current and future roles. A copy of the study results can be provided upon request at the conclusion of the study which might be shared with academic leaders.

Will anyone know what I do or say in this study (Confidentiality)?
All information shared by the participant will be held in strict confidentiality. Any data under control of the investigator will, if disclosed, be presented in a manner than does not reveal the subject's identity, except as may be required by law. As an example, the subject might be referred to as "Participant 1" from "Institution A, or simply "1A." Should the participant agree to having the interview recorded, such recordings will be securely stored in a digital format and encrypted to ensure confidentiality throughout the duration of the study. Upon completion of the study, any recordings will be permanently deleted.

Will I receive any compensation for participation?
There will be no compensation for participation in this study.

Is there a different way for me to receive this compensation or the benefits of this study?
There will be no compensation for participation in this study

Who can I contact for information about this study?

Contact information:
Jerald Todd
todd1jw@cmich.edu
989-615-1253

Dr. Benjamin Jankens
Janke1bp@cmich.edu
989-774-1570

You are free to refuse to participate in this research project or to withdraw your consent and discontinue participation in the project at any time without penalty or loss of benefits to which you are otherwise entitled. Your participation will not affect your relationship with the institution(s) involved in this research project.

Who can I contact outside of the study team for information about this study?
If you have questions about your rights as a research participant, wish to obtain information or report a case of research-related injury, ask questions, discuss any concerns about this study, or wish to offer input about this study with someone other than the researcher(s), please contact the:

Central Michigan University Institutional Review Board
600 East Preston Street
Foust Hall 104
Mount Pleasant, MI 48859
Phone: (989) 774-6401
Email: IRB@cmich.edu

APPENDIX G
CROSSWALK TABLE

	Essence of being an IT professional in HE	Technology	Culture	Motivation	Student learning	Operational effectiveness
What lead you into the field of technology?	X	X				
What are your technology-related hobbies?	X	X				
What do you feel are your strongest technological skills?	X	X				
What do you feel are your weakest technological skills?	X	X				
What do you feel are the benefits of working in IT?	X	X				
How much time do you spend experimenting with or learning new technology at work?	X	X				
How would you describe the culture of the college/university?	X		X			
How would you describe the culture of your IT department?	X		X			
How well do those in your department interact with one another?	X		X			
How do you feel you are stereotyped as an IT professional?	X		X			
What aspects of your job are the most motivating?	X			X		
What aspects of your job are the least motivating?	X			X		

What do you feel are the best aspects of working in higher education?	X			X		
What drawbacks do you feel there are in choosing to work in higher education?	X			X		
How do you feel the work you perform impacts your students?	X				X	
What role do you feel your education has played in your success?	X				X	
In what ways do you feel student success impacts the decisions you make in your duties?	X				X	
How much time do you feel student success impacts the decisions you make in fulfilling your duties?	X				X	
How much time do you spend working directly with students?	X				X	
How much time do you spend working directly with faculty?	X				X	
How do you feel the work you perform impacts the effectiveness of faculty in their reaching roles?	X					X
How do you feel the work you perform impacts the effectiveness of staff and administrators?	X					X
How much time do you spend working	X					X

directly with staff members?						

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