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Academic Analytics in Higher Education: Barriers to Adoption

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Walden University
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Abstract

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MA, New Mexico Highlands University

BA, University of New Mexico

Dissertation Submitted in Partial Fulfillment

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Abstract

The analysis of big data points and the use of data analytics have proven successful in improving corporate business efficiencies, growing profits, and increasing competitive advantages. The theory of academic capitalism, which holds that institutions of higher education are becoming more like corporations due to declining operating funds and the need to become more efficient, transparent, and competitive, guided this study. Despite the positive outcomes that analytic tools may produce in advanced efficiencies and competitive growth, college academic administrators have not yet adopted these tools, due in part to barriers facing the administrators. The purpose of this phenomenological study was to explore the nature of those barriers in a community college. Ten academic managers in 6 community college divisions who reported accountability for criterion-based key performance indicators were interviewed on their perceived use of academic analytic tools and barriers in adopting these tools. The interviews were collected and analyzed through preliminary grouping, reducing and eliminating outliers, clustering descriptions into categories, and constructing themes. The managers' narratives suggested that there were 4 perceived barriers that prevented the adoption of tools such as organizational bureaucracy (climate), restricted organizational data (policy), training, and infrastructure. An important area for further research involves identifying the strategies managers could use to overcome these barriers. The findings of this study will assist college administrators in implementing analytic tools. Such tools will improve key performance indicators, resulting in a more cohesive and cost-effective academic experience for students, faculty, administrators, and the community.

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Dedication

College administrators have often been overlooked in their efforts to increase student success. This dissertation is dedicated to the individuals who work daily to improve the lives of students by supporting faculty and staff so that they can give their best to their students, working tirelessly to hold the bottom line, and who are always striving to improve their institutions.

Acknowledgments

This journey has taught me that wanting something is just not enough. This route lead me to obstacles that I had not foreseen but steered me to an unrelenting pursuit of my goal to help advance technologies that will aid in student success. My husband, Robert Cinotti, has been my cheerleader, counselor, and champion who pushed and pulled me through this journey. I owe so much gratitude to Carol Urban of which this study owes it foundation. Thank you also to Pascale Hardy for chairing this endeavor and to John Nirenberg for helping push the process along when everything seemed to stall.

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Chapter 1: Introduction to the Study

Introduction

Successful companies such as Amazon and Netflix collect and analyze customer data to build their operations (Chen, Shiang, & Storey, 2012). The use of business intelligence tools, such as analytics, has helped to increase the overall growth of business operations including customer retention, return on investments, profit structure, and business total value (Minkara, 2010). These successes are linked to the use of analytics in retail, financial, manufacturing, and telecommunications industries (Seng & Chen, 2010).

Higher education, similar to the business sector, has collections data concerning its customers and general operations. Student data regarding finances, grades, study habits, education goals, and living arrangements are collected (Vialardi et al., 2011). Operational data, including space allocation, police and safety activities, residential accommodations, food services and maintenance issues, are also collected and stored (Dziuban, Moskal, Cavanagh, & Watts, 2012). However, colleges and universities are slow to analyze these data points to help make effective decisions and data-driven forecasts (Baepler & Murdoch, 2010; Dawson, Heathcote, & Poole, 2010).

Researchers have used data to make decisions in higher education to increase student retention; provide transparency of financial reporting; improve management of space, safety, and security; provide visualization of operations in true time; and supply decision support based on facts (Bichsel, 2012). Improved student retention can lead to increased graduation rates (Bichsel, 2012). When colleges and universities use data to manage key performance indicators, they save money, decrease time from enrollment to

graduation, and have more transparent ways to track successes and improve forecasts (Dziuban et al., 2012; Smith, Lange, & Huston, 2011). I designed this study to explore the reasons why an institution of higher education has not adopted analytics to increase efficiencies.

In this chapter, I review the background of analytics in higher education institutions in the United States. I also examine the problem and purpose of the study. Research questions that guided the study are considered, coupled with the theoretical framework, scope, and the limitations of the study.

Background

Higher education institutions have traditionally operated in the United States in a nonprofit model, depending on state and federal funding to sustain their efforts (Metcalfe, 2010; Oblinger, 2012). Recent budgetary constraints have led colleges and universities to reconsider their operational practices and focus more on meeting budgetary obligations (Ravishanker, 2011). The use of academic analytics may significantly assist colleges and universities in these efforts.

Academic analytics, as defined by Barneveld, has been adopted and used by educational institutions to help retain students and increase funding resources; however, there are few institutions of higher education that are adopting analytics (Barneveld, 2012). Barneveld (2012) defined academic analytics as data-driven decisions used "for operational purposes at the university or college level, but it can also be applied to student teaching and learning issues" (p. 4). Baylor University and Purdue University, and a few other higher education institutions, implemented academic analytics to help

student retention, recruitment, fundraising, grant administration, and analysis (Baepler & Murdoch, 2010). However, academic analytics is still in its infancy as a field, and higher education institutions as a whole continue to challenge its use (Barneveld, 2012).

Baylor University has used analytic tools to help build predictive modeling to increase efficiencies in student recruitment with measurable increases in admissions over a 1-year time period (Willis, Campbell, & Pistilli, 2013). Purdue University is using academic analytics to help predict student success through preemptive intervention strategies within their learning management system (Willis et al., 2013). These examples do not reflect the actions of the majority of higher education institutions and their academic administrators' use of analytics to manage key performance indicators (Dawson et al., 2010; Ravishanker, 2011). A need exists for researchers to explore factors that impede the adoption of analytic tools that increase efficiencies in the management and operation of higher education institutions.

Problem Statement

Knowledge management is a broad term used to label activities such as the use of business analytics and information technologies to bolster efforts in decision sciences, decision making, and collaborative efforts to increase the competitive advantage of an organization (Krogh et al., 2013). Knowledge management has gained popularity in corporate businesses during the past decade (Davenport, Harris, & Morison, 2010). Corporate businesses have begun to use knowledge management and knowledge workers to enable employees to join other workers across global organizations, increase communication lines, improve efficiency and effectiveness, and boost innovation and

competiveness (Davenport et al., 2010). The corporate world has embraced knowledge management to the extent of hiring knowledge officers and knowledge managers; however, knowledge management has not yet permeated institutions of higher learning (Davenport et al., 2010; Dawson, 2010).

Higher education administration has not yet taken advantage of corporate business strategies, such as the incorporation of knowledge management as a key partner to efficiently manage business agendas (Dziuban et al., 2012). Knowledge, used effectively, can help higher education administrators control their bottom line. Student success and increased retention rates, heightened grant and alumni fundraising, increased full-time and part-time faculty effectiveness, better space allocation, and fine-tuned recruitment strategies are examples of how better use of knowledge through data analysis can help colleges and universities increase efficiencies (Barneveld, 2012).

Purpose of Study

The purpose of this qualitative, phenomenological study was to explore the barriers which academic administrators perceive as preventing an institution of higher education from adopting analytic tools that would enable the analysis and use of data for decisions, planning, and managing operations.

Research Questions

In this study, I sought to explore barriers related to the adoption of knowledge management, specifically academic analytic tools, in higher education. The general research question that guided this study was the following: What factors impede the

implementation of academic analytic tools in a higher education setting? Subsequent questions included

1. Are academic administrators aware of how academic analytics could help manage key performance indicators?
2. What types of discrete databases do academic administrators currently use to help the management of their perspective departments?
3. How can knowledge management tools enhance the efficiency of a higher education institution?
4. Does the climate of a secondary education institution hinder the adoption and use of analytic tools, or are there funding/investment issues?
5. Would college administrators use academic analytics to help increase student success and other managerial tasks?

Theoretical Framework

Institutions of higher education have become more like corporations due to changes in their traditional sources of state or federal funding, declining grant and research funding, and other decreases in investments or donations and financial gifts (Metcalfe, 2010; Stocker, 2012). Colleges and universities must seek funding through creative and nontraditional sources in the marketplace, thus bringing them closer to operating like businesses in the private sector. The theory of academic capitalism is used to address the ways in which institutions of higher education are becoming more like business corporations. The concepts that provide the crucial underpinnings to this theory include success, performance, competitiveness, and accountability (Park, 2011; Slaughter

& Cantwell, 2011). As higher education institutions become more like big business, such institutions become more resource-conscious and market-focused and recognize a need for transparency. Academic analytics are potential tools that can be used to measure the concepts of success, performance, competitiveness, and accountability. Businesses use knowledge management and tools such as business analytics and data mining to create a competitive advantage. Role players within higher education setting could use these tools for colleges and universities to control for tightening budgets and decreased funding sources (Stocker, 2012). I discuss the theory of academic capitalism in detail in Chapter 2.

Nature of Study

I designed this qualitative, phenomenological study to understand and explore the experiences of individual academic managers in a higher education setting, their experience in using or not using analytics, the meaning behind their perceptions of their use or nonuse of analytic tools, and perceived barriers to the adoption of analytics. The main manuscripts examined in determining the design for this study included Creswell (2012, 2013), Merriam (2009), and Englander (2012). I designed the study to gather personal data from the interview process to explore barriers that prevent colleges and universities from adopting analytic tools to support management efficiencies. According to Creswell, Merriam, and Englander, qualitative research methods allow for an interview data collection process and the need for an intensive study. The mission of qualitative research is to (a) explore how people understand their experiences, (b) discover how

people create their worlds, (c) understand how people make sense of their experiences, and (d) describe how people understand their experience (Merriam, 2009).

I considered the case study and phenomenological research traditions for this study (Creswell, 2012). Case study concerns an issue explored "through one or more cases within a bounded system" (Creswell, 2012, p. 73). Simon (2011) reported that researchers use case study research when the inquirer establishes a problem and uses questions such as why and how. A case study was considered for this research because I wished to explore a bounded system in which several individuals would be interviewed and the research questions were focused on why and how. I deemed the choice of a case study inappropriate due to the data collection sustained in such a design. Data collection in a case study draws on multiple sources to include observations, documents, archival records, physical objects, and audiovisual materials (Creswell, 2012). The primary data collection for this study was rooted in in-depth, open-ended interviews.

The use of phenomenology was chosen because of the emphasis on open-ended interviews as the primary data collection, the general inquiry into the meaning and significance of the experiences from the participants, and the phenomenological approach Cilesiz (2011) established in research of the use of technologies in educational settings. Singleton and Straits (2009) and Cooper (2010) also posited that the social science researcher's purpose is to gain an understanding and to capture the essence about how people think and feel and how they interact during phenomena. Additionally, Simon (2011) stated that "phenomenological research is people's experience in regard to a phenomenon and how they interpret their experiences" (p. 105).

Definitions

Academic analytics: Academic analytics refers to "analytics used to help run the business of the higher education institution" (Oblinger, 2012, p. 10). In this study, academic analytics referred to the process by which education and academic personnel use advanced applications and statistical techniques to analyze data sets (Baepler & Murdoch, 2010).

Academic managers: Persons whose task it is to handle crises, complexities, and to instill a unified culture within the organization (Din, Khan, & Murtaza, 2011). In this study, academic managers were the managers at the college who had the task to increase student engagement, align academic policy with curriculum, conduct faculty observations, and increase student retention and student graduation rates.

Barriers to IT adoption: Barriers to IT adoption are those factors that inhibit organizations or individuals in the implementation or strategic use of information technology to increase competitive advantage and profitability (Davenport et al., 2010). In this study, barriers to IT adoption included those factors that hinder academic administrators in their adoption and use of academic analytic tools. Such barriers may include cost, perceived usefulness, knowledge of available tools, training, and other institutional issues.

Dashboards: A dashboard is the collection of disparate information systems and huge data sets, gathered and displayed in an uncomplicated manner, which provide graphic depictions of real-time insight in manager's performance. Dashboards can often give immediate snapshots of detailed information, which might have taken time-

consuming measures and inefficient time to produce manually (Stocker, 2012). In this study, dashboards were used by educators to view key performance indicators (KPI) visually and in real-time. The dashboards were customized dependent upon measured indicators (KPIs) for each academic manager.

Key performance indicators: Key performance indicators are assessments and indicators by which a University measures its efficiencies, performance, and success (Sukboonyasatit, Thanapaisarn, & Manmar, 2011). In this study, the key performance indicators that indicated measurement of academic management effectiveness included student retention, faculty training and observation, the management full time equivalent budgetary operations, curriculum reviews, and policy compliance.

Knowledge management: Knowledge management is the use of strategies to manage corporate knowledge, insights, experiences, and the incorporation of those experiences to add value to the corporation (Davenport et al., 2010). For this study, knowledge management referred to the use of the results from data analysis of multiple factors in the higher education including, but not limited to, admissions, retention, financial services. Specific examples included in this study, is the use of data to manage academic key performance indicators.

Shadow systems: Shadow systems are information technology programs, applications, or systems that operate on the outside of an organization (Behrens, 2009). In this study, shadow systems referred to information data collections not housed in the official college database system. Examples included departmental and siloed spreadsheets, FileMaker Pro databases, MS SQL, and other forms of information

technology that existed outside of the official college information system (Blanton, 2012).

Assumptions

For this study, the following assumptions were made:

1. Business analytic tools are valid and useful methods to increase the efficiencies of businesses for success, increased financial viability, and improvement.
2. Business analytic tools could also benefit institutions of higher education to increase productivity measures, similar to the business corporate world.
3. Institutions of higher education have not yet adopted business analytic tools.
4. For this study, I assumed that higher education institutions have not yet adopted business analytic tools because of existing barriers.

Scope and Delimitations

Researchers have indicated that the use of analytics to drive decisions improves efficiencies in higher education institutions. I designed this study to explore the reasons why colleges and universities do not adopt proven technologies, such as the use of analyzing data, in order to improve performance. This study covered a large, multicampus community college with a student population of approximately 85,000 full- and part-time, campus-based, and on-line student body. The college employs approximately 3,500 faculty and staff. The primary focus of the study was in interviewing academic managers whose key performance indicators include student retention, faculty training and observation, the management of full-time equivalent

budgetary operations, curriculum reviews, and policy compliance to ascertain why they did not employ analytics to help them better control their key performance indicators. These academic managers, who were responsible for the specified key performance indicators, numbered 25 individuals. These academic managers worked in academic divisions across all six campuses. The established period for the data collection occurred in the Fall 2013 academic school year.

I excluded data collection from other departments outside the academic departments within the college from this study. Primary examples of excluded departments included the office of institutional reporting (this department collects and cleans data for the college), the campus police department, student financial aid department, the admissions department, business office operations, maintenance and facilities departments, IT services and operations, human resources department, and training departments. Most view these departments as "support" services for the main academic mission of the college or university and, thus, do not directly affect academic administrators' goals of improving performance indicators. The excluded departments would benefit from the use of analytics, but improving academic performance indicators and the use of analytics, or barriers to the use, by academic administrators to achieve those goals was the focus of this study.

Limitations

For this study, the following limitations were recognized:

1. I used a small sample and single setting for this study. Only 25 managers had academic key performance indicators, as listed earlier.

2. There may have been additional administrators who were aware of, or were using analytic tools, that I did not interview.
3. Due to the need for a criterion sample and the time available with academic administrators, I used interviews as the primary method of gathering information.

To control for these limitations, I conducted member checks of transcriptions and peer review of results.

Significance

Knowledge management tools such as analytics have been used to successfully help businesses use their intellectual capital more effectively, thus making a positive impact on the bottom line (Davenport et al., 2010). Due to changing economies and funding constraints, institutions of higher education need to develop strategies to meet their fiscal responsibilities (Metcalfe, 2010). The adoption of academic analytics may be a way in which colleges can become more efficient and increase the value of their services. This study may help higher education academic administrators realize the factors that impede adoption of analytics and ways in which these key tools can help sustain their bottom line, increase efficiency, and promote graduation and placement rates.

Summary

Institutions of higher education have large data collections that could assist these organizations to operate more efficiently. Student data such as financial aid, grades, and housing accommodations, and operational data including space allocation, food services,

and maintenance issues, are also collected. Colleges and universities are slow to analyze these data points to help make effective decisions and data-driven forecasts to improve their operations.

The use of data to make decisions in higher education increases student retention; provides transparency of financial reporting; improves management of space, safety, and security; provides visualization of operations in true-time; and supplies decision support based on facts (Bichsel, 2012). When colleges and universities use data to manage key performance indicators, they save money, decrease time from enrollment to graduation, and they have more transparent ways to track successes and improve forecasts (Dziuban et al., 2012; Smith et al., 2011). Despite the positive outcomes that analytic tools may bring, academic administrators have not yet adopted these tools. I designed this study to explore the barriers behind why academic administrators in a community college have not adopted analytics in order to increase efficiencies.

In the next chapter, I provide an overview of business analytic tools, the use of such tools in the corporate world, what is known about the current use in higher educational settings, and the barriers to adoption that have been noted in other industries. The following chapter, Chapter 3, describes how I conducted this study. In Chapter 4, I present the data that were collected, and Chapter 5 contains a synopsis of the study, interpretation of the findings, limitations of the study, recommendations, and implications of the study.

Chapter 2: Literature Review

Introduction

The use of analytics to help drive decisions and meet key performance indicators in higher education institutions has been proven to be effective (Barneveld, 2012). However, colleges and universities continue to be slow to adopt academic analytics, even though business industries have adopted and seen the benefit of its use (Dawson, 2010). The purpose of this study was to gain an understanding of the barriers that impede the implementation and use of knowledge management, as described in this literature review as academic analytics, in a community college setting. The limited use of academic analytics in selected colleges has had a positive effect on key working indicators, such as reduction of student attrition, increased availability to track student registration and course selection, and more effective use of space (Dziuban et al., 2012). However, the use of analytics in the day-to-day operations of higher education institutions continues to remain minimal (Bichsel, 2012).

This literature review begins with an overview of analytics and how corporations use analytics in corporations to control for customer loyalty, customer fulfillment, and approval and to track return on investments (Minkara, 2012). Technologies used in analytics, and the value such technologies have in the business world, are discussed. I then review the use of analytics in higher education institutions, with specific colleges and their employment of analytic tools in operation. Further, I examine the value of analytics in higher education, in addition to barriers that could cause universities and colleges to not adopt analytics for wide-scale use in the management of operations

(Bichsel, 2012; Ravishanker, 2011). Finally, because institutions of higher education have been slow to adopt analytics as an innovation that may improve performance and there are limited studies in this area, I consider an examination of barriers to innovation adoption that may provide areas that also impede adoption at institutions of higher education.

Literature Search Strategy

A key word search using the following terms was conducted: *academic analytics, education analytics, student selection, academic data mining, student retention and data mining, education and data mining, data mining and education management, business intelligence and education, data mining and colleges, analytic tools definition, analytic tools, analytic tools and business adoption, business analytic tools and adoption, business analytic tools, data analytics, action analytics, barriers to IT adoption, barriers to adoption and analytics, innovation adoption,* and *barriers to innovation adoption*. The search was done using Gartner, Business and Management Sage Database, Business Source Complete, Google Scholar, Emerald, Science Direct, ProQuest, ERIC Education Database, Education Research Complete, Education Full Text (H. W. Wilson), Educational Administration Abstracts, Business Abstracts with Full Text (H. W. Wilson), Business Source Complete, and Psychological and Behavioral Sciences Collection. The search yielded 48,084 publications. The highest returning terms were from Google Scholar *data analytics* (18, 400) and *barriers to IT adoption and analytics* (16,600). Other high yielding terms included *barriers to IT adoption* (1,884) from ProQuest

academic analytics (337) from Sage, and *data mining and education* (863) from Emerald Management.

Inclusion criteria for relevant articles were the following: (a) publications that addressed analytic tools; (b) publications that addressed the use of analytic tools in business; (c) publications examining the use of analytic tools in higher education institutions; (d) publications addressing the new challenges higher education is facing; (e) publications addressing how the use of analytics has helped higher education institutions; (f) publications reporting barriers to IT adoption in businesses; and (g) articles discussing barriers to IT adoption in higher education institutions, innovation adoption, and barriers to innovation adoption.

Primarily, I rejected 47,853 articles by a review of the title because it did not meet the inclusion criteria. I rejected an additional 156 after a review of the abstract. Of the 75 that met the inclusion criteria, 32 were excluded due to their focus on modeling and structure functions, eight more were excluded due to their focus on singular database role, and six were excluded because their use of analytics was concentrated solely on research methodology.

Theoretical Foundation

The theory of academic capitalism was used to provide the theoretical foundation for this study (Slaughter & Cantwell, 2011). Academic capitalism is the theory that colleges and universities are changing and becoming more like corporate entities (Walker, 2009). Slaughter and Cantwell (2011) described the links and resource dependency that higher education institutions are sharing with industry and how these

links are allowing universities to compete in the globalization of a new economy. Park (2011) described academic capitalism in market terms. Higher education institutions, because of increasing scarcity of government funding, must obtain subsidies elsewhere. Colleges must search and compete for external funding sources through endowment monies, external grants, industry collaborations, contracts, and with the increase of tuition and fees. Some universities have formed quasi-corporations through the creation of university hospitals. A university does not technically own these university hospitals; however, the affiliated university has the opportunity to garner resources, such as laboratories, clinical space, and research, and has further access to additional external grants and endowment funds (Park, 2011).

It has been shown that colleges and universities are increasingly interacting with the business commercial sector. Park (2011) argued that institutions of higher education interact in the economy through initiatives and continued development. Park claimed that the Internet originated in a university, a tool that has changed the landscape of economies, not only here in the United States, but globally. Colleges have also engaged in the globalization of education using extensive online, distance, study abroad programs, in some occasions, the opening of entire campuses in foreign countries (Park, 2011). Universities show further examples of their movement towards the business sector in the growth of university-owned patents. Patents held by universities more than tripled over the past decade (Park, 2011). Additionally, universities have begun to acquire equity in companies in which technologies, developed by the particular university, are licensed. As

a result, technology licensing offices, community outreach and economic development offices, and fundraising departments have developed on campuses (Park, 2011).

Colleges and universities, in moving closer to the market place and competition, are being required to become more transparent to measure outcomes and to demonstrate success (Blanton, 2012; Grajeck, 2011; Ice et al., 2012; Metcalfe, 2010; Peterson, 2012; Stocker, 2012). Metcalfe (2010) used the theory of academic capitalism as the foundation for an analysis of the globalization of higher education and the use of information technology to manage key performance indicators. Stiles (2012) entailed the key factors affecting higher education, one of which was that colleges and universities need to increase their economic competitiveness, accountability, and institutional business decisions. Stiles stated, “Under the right circumstances, decision-making can be enhanced by the tools and techniques of analytics. Large data sets, analytics engines, and new data-visualization techniques have considerable potential to enhance both student learning and institutional business intelligence” (p. 3). The use of analytics, as Stiles indicated, can help college administrators make better decisions that may facilitate decreased institutional costs and increase student performance.

Proponents of the theory of academic capitalism addressed the ways in which institutions of higher education are becoming more like business corporations. The concepts that provide the underpinnings to this theory include success, performance, competitiveness, and accountability (Park, 2011; Slaughter & Cantwell, 2011). Researchers have demonstrated that, with the use of analytic tools borrowed from corporate business, colleges and universities may have success in meeting and exceeding

key performance indicators in areas such as student retention, student progress, budget and planning, faculty training, and course scheduling (Anderson & Russell, 2012; Fritz, 2011; Macfadyen & Dawson, 2012; Obinger, 2012; Wishon & Rome, 2012). Businesses use knowledge management and tools such as business analytics and data mining to create a competitive advantage to achieve success, improve performance, and increase economic competitiveness and accountability. Institutions of higher education are becoming more like business corporations and must use all tools available to address key performance indicators.

Key Concepts in Analytics

Businesses have collected unprecedented amounts of data regarding customers' purchasing habits, decisions, values, and experiences (Fahey, 2009; Minkara, 2012). Businesses have been able to store this mostly structured data in assorted databases and various systems (Fahey, 2009). Recently, business organizations have begun to apply these data to transform operations (Davenport et al., 2010). Data analysis entails the use of data to enhance operations, and the tools used to perform this analysis include such technologies as interactive visualization, dashboards, data mining, and predictive modeling (Chen et al., 2012; Davenport et al., 2010).

Analysis of data, or business analytics, entails the use of tools such as statistical and quantitative techniques, methodologies, applications and systems for industries to make better decisions regarding market demands and customer expectations (Chen et al., 2012; Davenport et al., 2010; Fahey, 2009). Researchers could also use these new technologies, or analytic tools, to measure key performance indicators, return on

investments, and other business indicators that drive growth (Minkara, 2012). Business leaders are engaging analytics to support strategic planning and progressive thinking to transform the way their enterprise is operated (Davenport et al., 2010).

Business Use of Analytic Tools

A 2012 study conducted by the Aberdeen Group, found that businesses using analytics achieved a greater growth rate (17.3%) than businesses not engaging in analytics in their day-to-day operations (9.1%; Minkara, 2012). Minkara (2012) described areas in which businesses excel in using analytics as (a) customer retention, (b) customer value, (c) customer satisfaction, and (d) return on investments. Within these vital areas, industries using analytics had positive year over year growth. Through analytics, it was possible to provide customers valid customer-centric content, a single source of data for key stakeholders, and the ability to track and make use of customer experience statistics.

Many businesses use analytics in e-commerce and marketing fields to collect and analyze customer behavior patterns and opinions (Chen et al., 2012, Davenport et al., 2010). Vendors such as Amazon use data analytics to create specific customer content driven recommender systems based on customer preferences (Chen et al., 2012). Business analysts analyze and collect data from social media outlets in order for businesses to better understand the opinions and behaviors of customers, and target their audience in a much more efficient way (Chen et al., 2012).

The United States Government, State Governments, and politicians are beginning to use business analytics for blogs, research, and campaign advertising. The aforementioned officials can use data mining to help support political discussions and to

help collect donations. Analytics support governmental accountability and transparency; broader platforms including blogs, wikis, and other social media outlets track and publicize programs (Chen et al., 2012).

Researchers within the fields of science and technology increasingly adopt big data projects in order to help researchers and students push knowledge boundaries and explore new developments through simulations and predictive modeling. Scientists in astronomy and physics are amassing several hundred gigabytes of data each day that they analyze using business analytics (Chen et al., 2012). This information will lead to discoveries much faster and on a larger scale than the science community has previously been able to deliver.

Business analytics contributes to health sciences and public health as well. As the health services field moves to patient-centered, or customer-centered, medicine, business analytics help in the area of decision sciences. Electronic health records play a large role in preventative, evidenced-based practices, and analytics power these systems. New modeling and process learning techniques are increasingly prevalent in the health sciences (Chen et al., 2012).

Individuals within public security sectors use business analytics to bolster counter-terrorism activities. The advancement of security informatics aids in cyberspace intelligence, emergency preparedness, and international data exchanges. Intelligence agencies worldwide are gathering statistics that cover the range from criminal threats, terrorism activities, and organizational cyber security incidences. Business analytics uses

applications and platforms that enable security personnel to evaluate, analyze and in many cases, prevent attacks (Chen et al., 2012).

Businesses use analytics applications for customer retention programs and tracking, stock market prediction analysis, inventory and product analysis, and advertising. Industries that have bought into business analytics include retail franchises, financial enterprises, manufacturing, and telecommunications trades (Seng & Chen, 2010). Direct marketing, product to consumer analysis, product-rating predictions, yield ratings and analysis, and fraud detection and collections are only a few of the widely used applications that businesses employ analytic tools.

Analytics in Higher Education

Higher education institutions in America are among the casualties of globalization, economic uncertainties, public funding shortfalls and drastic cutbacks, and heightened accountability and transparency regulations (Picciano, 2012). Leadership in these organizations needs to respond with financial plans that will control for these challenges and set a path forward that will allow for stability and growth (Smith et al., 2011). A solution that colleges have increased interest in is that of using technology to drive change (Dziuban et al., 2012).

One technology that higher education institutions have adopted to control their business is enterprise resource planning technologies. These systems collect transactions in the areas of human resources, finances, and budgetary functions and deposit the information in relational databases (Ravishanker, 2011). These systems have helped colleges collect and store massive amounts of essential data.

Another technology that has permeated college existence is the expanding platforms for course delivery (Picciano, 2012; Sinha, Arora, & Mishra, 2012). Blended courses, a combination of both online and on ground instruction, is growing rapidly as colleges make use of technology and as faculty become more comfortable with this mixed design. Due to the growth and use of the Internet, millions of college students enroll in online courses and fully online programs (Picciano, 2012). Colleges have adopted learning management systems to control and distribute learning for students; these systems have created a platform that enables students to access an education environment virtually (Siemens & Long, 2011).

Both of these technologies, along with others that are outside of the scope of this paper, collect massive amounts of data relating to the business operations of colleges. The next step for colleges is to follow companies such as Netflix and Amazon, and make use of their massive amounts of data to inform decisions. Business analysts have used consumer data to help predict costumer purchasing habits, and, like Amazon, have built recommender machines to recommend products to customers based on past purchases and those of popular demand (Dziuban et al., 2012). The use of data is now common practice in business; however, the use of data to drive decisions in higher education is still in its early stages (Baepler & Murdoch, 2010; Dawson et al., 2010).

The analysis of large amounts of data for the use of decision-making in colleges or universities for operational purposes is termed as academic analytics (Baepler & Murdoch, 2010). Barneveld et al. (2012) suggested a conceptual framework that placed academic analytics in an open infrastructure that allows for predictive and action

analytics to help inform management and faculty decision-making. Figure 1 displays a visualization of academic analytics and its subcategories in learning analytics, predictive analytics, action analytics, and decision sciences (decision making) analytics.

Analytics

Business Analytics Academic Analytics
Learning Analytics
Predictive Analytics
Actionable Intelligence (Action Analytics)
Decision Making

Figure 1. Conceptual framework of analytics.

Fahey (2009) recommended, and Clow (2012) supported the use of predicative and action analytics to guide decisions through the manner of a process as described in Figure 2. That process includes the capturing of data, the reporting of the data, predictions made from the data, an action taken, and then refinement.

Figure 2. Analytics process.

Colleges that have adopted enterprise resource planning systems, that use various databases, and have implemented a learning management system for an online course deliver platform, are all collecting and capturing data. The issue is that these systems do not connect with each other, nor do they have the flexibility for growth, or do they have tools that can use prediction models to help fuel information that leaders can then act upon (Ravishanker, 2011). Some colleges have taken the next step and have adopted the

use of academic analytics; they apply technology to data to better manage their key performance indicators (Goldstein, 2005).

Use of Historical References

This study references the 2005 survey conducted by Goldstein. This is a benchmark survey in academic analytics. This survey, described later in this chapter, established that of the colleges surveyed, most used academic analytics primarily for data collection and retrieval. Colleges were not using analytics for strategic planning, decision making, or in the management of key performance indicators.

Bichsel (2012) conducted a survey to indicate the status of analytics in higher education institutions. Bischel surveyed 339 colleges and universities. Bichsel found that from the 2005 Goldstein survey seven years prior, not much change had happened; colleges and universities were collecting a rather large amount of institutional data, but the data were not being analyzed to make decisions or being used by managers to better control key performance indicators (Bichsel, 2012).

In this study, I used the Goldstein survey to establish a benchmark in academic analytics. The 2005 survey provided a measure consistently referenced by other studies and publications to establish a reference point; that in a period of seven years very little has happened in the academic analytics field.

In this study, I used two interview protocol designs from studies conducted in 2008. These two studies were published in (a) the International Journal of Training and Development (Ali & Magalhaes, 2008), and (b) the Journal of Decision Sciences (Venkatesh & Bala, 2008). Venkatesh and Bala used the interview questions from the Ali

and Magalhaes study published in the International Journal of Training and Development as a base of comparison to the interview questions. Studies of adoption in academic settings heavily cite Ali and Magalhaes' study. Al-alak and Alnawas (2011) cited Ali and Magalhaes' study. Fenio and Bright (2010) also cited the Ali and Magalhaes 2008 study in a case study they conducted covering academics and adoption of technologies. Ali and Magalhaes' (2008) study proved invaluable in this current study covering academics and the adoption of analytic technologies.

I modified questions from Venkatesh and Bala's (2008) Technology Acceptance Model 3 (TAM3) study to meet the needs of this study. Numerous researchers and in excess of 800 studies cited this 2008 TAM3 study, and the model itself is used consistently for studies in technology adoptions and user perceptions. Behrend, Wiebe, London, and Johnson (2011) and Munguatosha, Muyinda, and Lubega (2011) used Venkatesh and Bala's (2008) TAM3 model in their study. The use of Venkatesh and Bala's TAM3 model was integral to the interview protocol in this study.

Use of Academic Analytics

Goldstein, in the employ of the Educause Center for Applied Research, described five stages of the use of analytics to manage key operational areas in seven typical college/university departments (Goldstein, 2005). The first and most-used stage of analytics is that of transactional data and enterprise resource planning. Ravishanker (2011) described this first stage as a system that collects data in one system for the use of data retrieval. Goldstein (2005) explained stage two as that of analysis and monitoring of operational performance. The following stages enact scenario building, predictive

modeling, and finally, a system that prompts warning signals and notifications proactively. The outcome of Goldstein's work concluded that most college departments that were surveyed (n = 380) used academic analytics primarily in the Stage One area of data collection and retrieval (Goldstein, 2005). Table 1 indicates the college departments that were using academic analytics, the stages of development and usage, and the percentage each department was in during the survey collection period.

Table 1

Survey Results of Academic Analytic Usage

Use	AF	BP	BAP	IR	HR	RA	AA
Stage 1: Extraction and reporting	56.9%	68.4%	49.6	48.8%	62.2%	45%	52.8%
Stage 2: Analysis and monitoring of operational performance	11.0%	17.0%	19.6%	28.4%	7.8%	10.3%	18.2%
Stage 3: "What-if" decision support	2.3%	1.9%	13.5%	4.1%	0.6%	0.9%	4.7%
Stage 4: Predictive modeling	3.1%	3.0%	9.6%	11.6%	1.1%	1.7%	5.2%
Stage 5: Automatic triggers of business (alerts)	3.7%	2.5%	0.6%	7.1%	1.9%	1.1%	2.2%
Not active users	22.9%	7.1%	7.2%	0.0%	26.4%	41.0%	16.9%
Total	100.0%	100.0%	100.0%	99.9%	100.0%	100.0%	100.0%

Notes. Codes: AF = Advancement/Fundraising, BP = Business and Planning, BAP = Budget and Planning, IR = Institutional Research, HR = Human Resources, RA = Research Administration, AA = Academic Affairs.

Goldstein, P. (2005). Academic analytics: The uses of management information and technology in higher education. *EDUCAUSE Center for Applied Research*, 1–12.

As demonstrated by Goldstein's survey, there are a few colleges and universities using analytic tools. One example of how a college is using academic analytics is Purdue University (Pistilli & Arnold, 2010; Pistilli, Arnold, & Bethune, 2012). Purdue developed an early warning alert system to help students in the coursework. This system is behaviorally modeled; the system tracks how students use the on-line learning

management system, how much time they spend reading the required articles, viewing the videos, reading the discussion boards, and engaging with other students and their faculty (Pistilli & Arnold, 2010; Pistilli et al., 2012). The system tracks the effort the student puts forth in the course. Whether a student takes the time to ask for help, contact a tutor, or arrange an appointment with their instructor, is another indication of the student's effort. The first time a student's quizzes fall below the prescribed threshold, Purdue sends an e-mail to the student, automatically generated asking the student to review resource materials. Purdue also alerts the student's advisor and then calls the student to encourage tutoring and discuss an improvement plan (Pistilli & Arnold, 2010). Students at Purdue also have individual "dashboards" where they can track their own data and compare their performance against other students in the same course. This allows students to visualize and compare their efforts; they can see the resources used, time spent in reviewing sessions, assignments submitted by their classmates. Pistilli and Arnold tested two sets of students in the same course for two semesters. One set of students used the analytic tools (Purdue has named the system "Signals"), and the other set of students did not use the system. End of semester grades and help-seeking behaviors increased in the students using the system. There were fewer Cs, Ds, and Fs from the students using the system compared to those not using the system (Pistilli & Arnold, 2010; Pistilli et al., 2012).

Another use of analytics is the development of recommender systems. Vialardi et al. (2011) studied the use of a recommender system for student use at the University of Lima, Peru. The University found that students were taking courses based on inaccurate

information or a lack of knowledge about the courses. This method led students to take too many courses, or courses that they were not prepared to take. The university created a recommender system, with the use of data mining, to assist students in choosing courses. The recommender system reviews students' demographic information, prior grades earned, the number of courses taken each semester, average grade, and the cumulative grade the student has obtained (Vialardi et al., 2011). Additionally, the system allows for the difficulty of the course, and reserves times and places within the courses. The university then used this information to recommend courses in which the student has a great potential for success.

Pace University is another university that has been experimenting with academic analytics. Pace University had been collecting massive amounts of data on perspective students, but was unable to utilize all of the information effectively. The leadership took steps to allow for development of an analytics powered by Microsoft Business Intelligence. The University found that a common language for data was lacking, many different departments were using different definitions for similar data. Creating a data dictionary was the first step in moving to a common analytics system. Pace purchased the student module as the first module for implementation in order to help control for student retention. Because of using this system, Pace started to see a more complete picture of student data. They began to discover new data sources, which they could then combine with other data and began to see new perspectives into student life and student engagement (Ravishanker, 2011).

The University of Central Florida uses academic analytics to track faculty development scheduling and teacher credentials, to follow productivity in student registrations, course sections, student credit hours, and other operational projects (Dziuban et al., 2012). Data that were stored in many different databases across several various departments could be integrated and effectively used. Managers had the flexibility to run reports concerning headcounts, student demographics, faculty grant development progress, enrollment metrics, and teaching summaries. College administrators had dashboards that visually tracked their key performance indicators; this was in real time and allowed managers to see patterns, monitor growth, and efficiently solve challenges before they leave a negative impact on the College (Ravishanker, 2011).

Academic analytics can be used to predict at-risk students. Smith et al. (2011) studied the use of academic analytics in a community college to predict at-risk online students. The college needed a way to predict at-risk students before they began showing signs of failure, and a way in which to respond to the students through personalized contacts. The data set was comprised of on-line students who interacted with the college through a course management system; the students had no face-to-face interactions. The sample size was $n = 539$ students. The researchers analyzed variables such as login frequency, course management engagement, and points earned for assignments submitted. Smith et al. used the Pearson r correlation coefficients to establish and measure correlations. The results indicated a significant correlation ($p < .05$) between final course outcome and the variables. The college was able to intervene prior to failure with the use of analytics to predict at-risk students.

Another case evaluated by Forsythe, Chacon, Spicer, and Valbuena (2012) established the use of analytics helped to address problems such as student recruitment and retention. The University of Maryland Eastern Shore (UMES) began using an analytic dashboard that provided real-time data and targeted for key performance indicators specific to the admissions department and the retention specialists. UMES created and tailored dashboards to match the key performance indicators of the roles of end users such as administrators, faculty advisors, and support staff. UMES designed the dashboards, created by analytic tools powered by the wealth of institutional data, in a convenient format that allowed for alerts (Forsythe et al., 2012).

UMES, for example, created a dashboard to assist students and staff in the financial and registration process used at the beginning of each semester. The dashboard tracked students as they chose classes and then applied and used financial aid to pay for their courses. Staff members, with the use of data pushed to their individual dashboard, could monitor indicators daily to make sure students moved toward overall progress (Forsythe et al., 2012).

Using academic analytics, UMES has seen growths in key missions of the university. One of the important experiences that UMES has learned from the implementation of analytics was that “analytic tool sets currently provide unprecedented insight into data sets-allows users to disaggregate complex collections in real time” (Forsythe et al., 2012, p. 6). The ability for academic and staff personnel to be able manage, cut, slice, and drill down data at their desktops gave them huge opportunities to proactively meet targets and key performance indicators, thus engaging in the total

mission of the college to help keep students retained and improve graduation rates (Forsythe et al., 2012).

Successes measured during the first year UMES used analytics resulted in an increase of student enrollment by 150%. The college was also able to recognize course level structures and pinpoint areas of increased efficiencies in the management of courses and adjunct faculty hires. Additionally, retention rates for students increased during the third and fourth year terms. The college will eventually see a rise in graduation rates due to the retention rates of the third and fourth year students (Forsythe et al., 2012).

In a further example of successful use of academic analytics, Philadelphia University shared its challenges and goals when new leadership of the university set on a path to explore the universities operations. The university wished to scrutinize its operations by "examining trends, patterns and tendencies within the critical quality of data" that had been gathered after 10 years of using a resource planning system (Cepuli, Radhakrishanan, & Widder, 2012, p. 1). The university was certain that they had enough data collected to provide historical support of past patterns and behaviors. However, there was a lack of easy-to-use tools for leadership to access and an absence of an analytic environment in which to analyze and predict trends (Cepuli et al., 2012).

The university took steps to collect the historical data. They asked the academic deans to provide data regarding growth rates of programs and expansion of faculties. It quickly became apparent that the data were scattered in different siloed departments, and, that the data were mostly paper-driven, that information was not electronic. The university also discovered that much of the data that they were seeking, enrollment,

registration, course scheduling and course frequencies, had not been made available to the academic deans in any form (Cepuli et al., 2012).

Philadelphia University set a new and pressing goal. The university leadership knew of the importance of newly established transparency objectives within the university environment and that all parts of the university needed to operate from an informed centralized data source. The first step in the process to align university data in one central area, and to build usable dashboards for analytical trend spotting, was to assess the Universities readiness for analytics, and to assess key performance indicators in each area of operations (Cepuli et al., 2012).

The university took two years to develop and create dashboards for the use in front-line departments. End users in these departments saw the ability to make better decisions in course development and frequencies, resource utilization, consolidation of enrollments, and space and time reallocations. The leadership of the university was able to see a return on investment in the use of analytics, and a greater capacity to build a culture of transparency throughout the University (Cepuli et al., 2012).

As noted, an increased need for college and university transparency is changing the way higher education institutions handle their repository of data. At Portland State University, a situation arose in which increasing costs and decreasing state and federal funding was forcing the university to reevaluate how the university was using resources, budget models, and its student success rates. They were unable to answer key questions regarding these items because of the siloeing and inappropriate connection of legacy reporting and data sets (Blanton, 2012).

Further investigation revealed that faculty and staff had created local “shadow systems,” or different and numerous spreadsheets, databases, and word documents. The primary use of these disconnected systems caused redundancy, errors, and misaligned information (Blanton, 2012). Portland State University’s reporting environment “was a disconnected collection of data and reports from multiple disparate sources that were manipulated using a wide variety of tools” (Blanton, 2012, p. 2).

To move forward, the university had to plan to extract all the data from the disconnected systems, devise a plan to organize the data, and begin to analyze the coherent and grouped data. With this in mind, Portland State University assembled a team that collaborated with all constituent parties, resolved differing term definitions, and aligned the information with the key performance indicators of management and overall university goals. In addition, the team ensured that each level of management had appropriate access to the data, made certain new technologies were easy to use, and educated staff, faculty, and management on the complexities of the new analytics (Blanton, 2012).

The implementation of academic analytics resulted in evident positive outcomes for Portland State University. End users of data began asking better questions about the data and how the data could help in decisions making. There was increased collaboration throughout the university, and, reports that once took weeks to assemble took a matter of minutes to complete after implementation. Portland State University has begun to use analytics to move toward performance-based budgeting, instead of relying on “gut

feelings." As confidence in the new systems grows, the university made plans to abandon the old legacy and shadow systems (Blanton, 2012).

In another case of adoption of analytic tools, Saint Michael's College experienced benefits in the use of a dashboard to control for management key performance indicators. Typical problems faced by Saint Michael's College included, "too many reports and authors, inconsistent data definitions, a lack of systematic updates, poor coordination of key measures, and haphazard sharing of reports and updates" (Anderson & Russell, 2012, p. 1). The college admitted that many decisions were made by "gut feeling" due to the lack of consistent data, dated, or inaccessible data (Anderson & Russell, 2012).

Leadership of the college understood that one specific goal for the college was to attach benchmarking measures, or key performance indicators, to a dashboard, with the use of analytics. To begin to use the dashboard to control key performance indicators, the college needed to establish consistent data definitions, synchronize timing of data streams and cycles, elucidate data interpretations, and create a culture of transparency. Anderson and Russell (2012) hoped that with these objectives met, accountability for performance of key measures could begin.

The development and college-wide usage of the dashboard experienced challenges at Saint Michael's College. There were pockets of stakeholders that were unenthusiastic about sharing departmental data, and the college struggled to define, clarify, and standardize the most basic, but complex, terms. The development team had to explicitly focus on issues such as sharing of the data across departments and college-

wide, the interpretation of definitions, and the synchronization of data (Anderson & Russell, 2012).

Because of the team's collaboration, Saint Michael's College saw growth in the use of its dashboard to control for key performance indicators in the operational and strategic applications of the college. The dashboard was highly exploited and its use had increased to additional departments throughout the college. The college explained that "the dashboard has filled a gap by providing more timely, tactical data and supplementing our quarterly scorecard and annual fact book" (Anderson & Russell, 2012, p. 1).

A different success story of the use of academic analytics rests with Paul Smith's College. Paul Smith's College served a high-risk student population in that over 50% of the students are first-generation college students, and almost 50% of these students graduated in the lower half of their high school graduating class (Taylor & McAleese, 2012). The college needed to increase the success of students through increased retention and graduation rates. The challenge for the college was the early identification of its at-risk students, and the automation of data gathering, reporting, and communication.

Paul Smith's College implemented a predictive modeling analytics tool to predict using data, students' end-of term grade point average, and thus classify highly at-risk students and present them with counseling and tutoring services prior to the first day of the term. The college also implemented a system that would run routine reports and analyses automatically and disseminate results to targeted support teams. This analytic tool additionally sent communication to students regarding concerns of lower examination scores and participation rates. Support teams were also notified so that staff

could intervene early, as opposed to before the tool when support staff only saw scores a quarter or halfway through the term (Taylor & McAleese, 2012).

The college saw encouraging results with the use of the newly adopted analytic tools. The percentage of students placed on academic probation decreased by 36%. Additionally, the percentage of students who were academically suspended from the college decreased 41%. Graduation rates of students saw an increase of 23%, and the college experienced a rate of return on their investment of over $2 million dollars in net student tuition (Taylor & McAleese, 2012).

A final instance of positive returns from the adoption of academic analytics was that of Arizona State University (ASU). ASU is one of the largest higher education institutions in the United States, reporting more than 72,000 students spread throughout its four on-ground campuses. The growth of the institution and financial challenges helped AUS become one of the early adopters of academic analytics (Wishon & Rome, 2012).

In 1993, ASU developed a formal institutional wide database where all data were stored, and then used in various departments campus-wide. Users of this organized integrated system could build reports, perform analysis, and integrate data where necessary. The IT team used the integrated data to build dashboards to help recruitment and admissions processes, research endeavors, financial and budgeting expenditures, facilities management, human resources, and student affairs (Wishon & Rome, 2012).

To determine growth of analytics for ASU, the IT team began to think about monitoring the dashboards to discover which dashboards were being utilized the most,

and which information was being accessed the most. The team created a dashboard that observed and monitored the previously constructed dashboards; “they placed analytics on top of analytics” (Wishon & Rome, 2012, p. 1). With this usage dashboard, the IT team could see which departments were heavy users, what information they were using, and which dashboards they did not access.

Given this information, ASU could pinpoint areas to focus funding and determine growth patterns. The IT team could identify potential users and perform training when necessary. The knowledge provided by the analysis of the dashboards, via the usage dashboard, enabled AUS to become a data-driven decision making intuition (Crow, 2012; Wishon & Rome, 2012).

Although there are definite cases whereby colleges and universities have adopted academic analytics to great success, Bichsel’s survey conducted in 2012 concluded that the majority of institutions surveyed had not yet begun the first steps to adopt an analytic tool to help with the management of college enterprises, goals, and performance measures (Bichsel, 2012). Wagner and Ice (2012) explained that although businesses used pattern recognition and predictive analytics to make better decisions, analytics “are not yet broadly used in educational settings, where they could assist with activities such as selecting courses or predicting when students might be at a point of increased academic risk” (p. 33).

Non-Adoption of Academic Analytics

Goldstein (2005) surveyed 380 higher education institutions to discover how successful colleges and universities had been in adoption analytics to strategically drive

operations. His team asked questions about how prevalent the use of predictive modeling and alerts was, and how universities used analytics to drive decisions. Goldstein (2005) found that of the colleges and universities surveyed, only 15% used analytics in a strategic way; and that 46% used data for static reporting solely.

Bichsel (2012) conducted the "2012 Analytics in Higher Education" study to indicate the status of analytics in higher education institutions. Bichsel surveyed 339 colleges and universities, and found substantial amounts of institutional data collected in the areas of enrollment, finance and budget, student progress, research, and learning management were not integrated into one area whereby it could be analyzed to make proactive decisions (Bichsel, 2012). Dawson et al. (2010) argued that despite pockets of successful implementation of analytics in higher education institutions and a decade of business use of analytics to drive decisions and strategically plan, adoption in the education sector remained nominal.

Colleges and universities are under pressure to change the way they do business, to become more efficient, provide higher quality of services, and to be able to measure success (Siemens & Long, 2011). Colleges are faced with newer challenges of competition and decreased governmental assistance (Dawson et al., 2010). Researchers have shown that academic analytics increase student retention, provide answers to questions such as the cost of a degree, improve resource management, provide visualization of operations in true time, and supply decision support based on substantial facts (Bichsel, 2012). However, higher education institutions are still slow to adopt analytics due to either perceived or actual barriers (Bichsel, 2012; Dawson et al., 2010).

Barriers That Impede Adoption of Analytics

The biggest impediments for analytics adoption in business organizations lie in managerial and cultural concepts such as managers not knowing how analytics could help their business strategies, managerial priority competition, competing cultures within departments not wanting to share data, and a lack of analytic skills in-house (Lavalle et al., 2011). Unlike the barriers that impede businesses from adopting analytics, Bischel (2012) argued that higher education institutions do not adopt due to cost. Bichsel also indicated culture, infrastructure, and policy as being barriers. Other studies have indicated resource competition may be a barrier, or a competition between adoption of analytic tools and the option to hire additional instructors has placed colleges and universities at a standstill (Ravishanker, 2011).

Because institutions of higher education have been slow to adopt analytic tools which other business industries have found successful in helping to improve performance, and because such tools represent an innovation in the way in which higher education utilizes business processes, I also considered literature addressing barriers to innovation adoption. These studies most often addressed the adoption of a recent innovation in higher education, the adoption of eLearning technologies. They also provided potential information as to the reasons why higher education institutions may be reluctant to embrace innovative technologies, including analytics, even though they demonstrated their success in other industries, including higher education.

Several issues can motivate IT adoptions. Reid (2014) found that five categories influenced the adoption of an innovation such as instructional technologies. These issues

included (a) the technology itself, including access, reliability, and the complexity of the system; (b) the process by which such technology was implemented and the support provided to all levels of users; (c) administrative leadership and support; (d) the environment such an innovative change is implemented into, including changes in roles, control, and a shift in focus to a business model; and (e) the control and effectiveness of the users of innovative technologies. Lane and Lyle (2011) found that expertise in technology use, institutional support, and having strategies in place to facilitate adoption of innovative technologies were key factors in encouraging adoption. Singh and Hardaker (2014) also found institutional and managerial, or bureaucratic support necessary for the adoption of innovations such as eLearning. Managers not only provide support in resources, but also by providing role models for the use of such innovative initiatives and absent this support, significant cultural barriers exist to innovation adoption. These studies echoed earlier research by Johnson (2010), who found that the perception of risk, knowledge of the value of innovation adoption, trust in the system, size of the organizational system, and the readiness of the organization to utilize innovation may result in barriers to adoption of innovative strategies, even if they improve performance.

Gap in the Literature

Following the literature review, I was able to recognize that there were limited studies conducted as to why higher education institutions do not adopt analytics. The literature review helped provide an overview as to why colleges and universities are slow to adopt analytic tools that may be able to increase performance in key indicator areas. There were few studies, if any, directly exploring the reasons behind non-adoption in

higher education institutions. Businesses have adopted analytic tools that have improved key performance indicators (Chen et al., 2012; Davenport et al., 2010; Fahey, 2009; Minkara, 2012). Several higher education institutional organizations have adopted such tools with positive results (Dziuban et al., 2012; Pistilli & Arnold, 2010; Ravishanker, 2011; Smith et al., 2011; Vialardi et al., 2011). Relatively few studies have indicated the reasons why few academic institutions have yet to adopt such analytics (Bichsel, 2012; Ravishanker, 2011). A review of literature addressing barriers to adoption of other innovative technology suggested that the technology itself, the users, and the bureaucratic system may be major barriers to adoption (Johnson, 2010; Lane & Lyle, 2011; Reid, 2014; Singh & Hardaker, 2014).

This study extended the literature by exploring the reasons behind why a community college has not adopted analytics to help its academic managers better control their key performance indicators. These performance indicators included student retention, student engagement, faculty training and observation, improved access, curriculum updates, course scheduling, and student/faculty budget ratios.

By comparing the findings of this study to what is known through previous literature on the use of academic analytics and potential barriers to such innovation adoption, it was hoped that further research would be conducted. The goal of further research would be to help design proactive strategies so that the adoption of such tools could benefit both the users (administrators and students) and that success in key performance indicators may be realized.

Summary of the Literature

Through the literature review, I discovered that businesses, such as Google and Amazon, have been using analytics to increase productivity, strategically plan, and drive profits (Chen et al., 2012). I examined case studies whereby colleges have also had success using analytics to streamline admissions processes, increase student retention and success rates, track and plan for growth, and evaluate challenges and solutions (Dziuban et al., 2012; Smith et al., 2011). Through the study of the literature review, I was also able to determine that there was not wide spread use of analytics in higher education institutions, even after studies have indicated the positive results of usage (Bichsel, 2012; Dawson et al., 2010). The following chapter, Chapter 3, describes how I conducted this study.

Chapter 3: Research Method

Introduction

The purpose of this qualitative phenomenological study was to explore the barriers that inhibit higher educational institutions in their adoption of proven analytic tools to help improve management of key performance indicators. In this chapter, I described how I conducted this study. This chapter includes the research design, population, setting, instrumentation, data collection procedures, plan for data analysis, and the ethical procedures undertaken.

Research Design and Rationale

I designed this study to explore concepts related to the nonadoption of knowledge management, specifically academic analytic tools, in higher education. The general research question that guided this study was the following: What factors impede the adoption of academic analytic tools in a higher education setting? Subsequent questions included

1. Are academic administrators aware of how academic analytics could help manage key performance indicators?
2. What types of discrete databases do academic administrators currently use to help the management of their perspective departments?
3. How can knowledge management tools enhance the efficiency of a higher education institution?
4. Does the climate of a secondary education institution hinder the adoption and use of analytic tools, or are there funding/investment issues?

5. Would college administrators use academic analytics to help increase student success and other managerial tasks?

The main manuscripts examined in determining the design for this study included Creswell (2012, 2013), Merriam (2009), and Englander (2012). I designed the study to gather personal data from the interview process to explore barriers that prevented colleges and universities from adopting analytic tools to support management efficiencies. The mission of qualitative research is to (a) explore how people understand their experiences, (b) discover how people create their worlds, (c) understand how people make sense of their experiences, and (d) describe how people understand their experience (Merriam, 2009).

I reviewed qualitative and quantitative methods to determine the best approach for the study. Creswell (2013) noted key differences in qualitative and quantitative methods by comparing the two research inquiry approaches. When the researcher needs in-depth and detailed research, and when flexibility without categorization is desirable, qualitative inquiry methods are best (Creswell, 2012, 2013). Researchers should consider quantitative methods when they need to generalize large samples with limited responses on a broad scale (Creswell, 2012).

I designed this study to explore why the participants at a community college do not engage in the use of analytics to increase efficiencies. Creswell (2012) argued that the search to establish meaning behind thoughts, experiences, or behaviors would necessitate a qualitative research approach. I designed this study to explore, in detail, a complex issue that needed understanding with the desire to allow participants to share their

experiences to help form a better understanding of the problem. Singleton and Straits (2009) posited that the social science researcher's purpose is to gain an understanding about how people think, feel, and interact during a phenomena. To explore experiences and actions of participants, the researcher should ask open-ended, succinct questions as the principal strategy for qualitative social research (Creswell, 2012). These concepts helped guide this research in the direction of collecting qualitative data that generated straightforward quotes from people regarding their feelings, opinions, and experiences with respect to their nonuse of analytical data in their daily management activities and barriers that prevented them from usage (Singleton & Straits, 2009).

Phenomenological Study

I considered the case study and phenomenology research traditions for this study (Creswell, 2012). A case study concerns an issue explored "through one or more cases within a bounded system" (Creswell, 2012, p. 73). Simon (2011) reported that a researcher uses case study research when the inquirer establishes a problem and uses questions such as why and how. A case study was considered for this research because I wished to explore a bounded system in which several individuals would be interviewed and the research questions were why- and how-focused. I deemed the choice of a case study inappropriate, however, due to the data collection sustained in a case study. Data collection in a case study draws on multiple sources to include observations, documents, archival records, physical objects, and audiovisual materials (Creswell, 2012). The primary data collection for this study was rooted in in-depth, open-ended interviews.

I chose a phenomenological approach to qualitative research for this study. I designed this study to understand and explore the experiences of individuals managing departments in a higher education setting, their experience in using or not using analytics, and the meaning behind their perceptions of analytic tools. Additionally, Simon (2011) stated, “phenomenological research is people’s experience in regard to a phenomenon and how they interpret their experiences” (p. 105). The use of phenomenology was also chosen due to the emphasis of open-ended interviews as the primary data collection (Creswell, 2012).

Role of the Researcher

I had professional relationships with the population; however, I did not supervise any of the participants. This nonrelationship allowed me to remain as an outsider and an objective interviewer.

I gained access to the institution by a structured meeting with the director of institutional research for the college. The director of institutional research provided verbal permission at the time of the meeting. I attributed this immediate response to my employment within the college. The college’s institutional review board (IRB) conducted further negotiations concerning the determination of actual participant lists and a formal review prior to the data collection process.

My background in academics, specifically in managerial academic positions, guided my interest in exploring higher education management uses of academic analytics. However, I never worked in the capacity of an academic manager at the college under investigation in this study. The resolve to engage in a study of this college rested on the

resources that were available to me, as well as my familiarity with the college's administrative structure (Simon, 2011). I classified the knowledge of the managerial structure of the college as a strength for this study due to the need to interview key managerial positions within the college.

Methodology

Participant Selection Logic

College Z employs approximately 3,500 staff and faculty members working in six different locations and on-line. I took the population for the study from managers who had accountable key performance indicators and not from other individuals who would not have academic responsibilities that directly affect student retention, faculty performance, and academic curriculum and academic policy outcomes. There were 25 persons in this category. Only persons who had key performance indicators, which were measurable, would have the necessity to use analytic tools to assist them in meeting their goals. An example of a key performance indicator for an academic dean is to retain a certain amount of students in a program from one semester to the next.

I used a criterion sampling method to learn more about how, why, if and why not, College Z used academic analytics. Merriam (2009) suggested, in a qualitative study, to select participants from the sample in which the researcher can learn information. With this in mind, I focused on participants who met certain criteria. Only employees who had measurable key performance indicators were in a position to use analytic tools. Within this population, I selected participants in an academic department. This selection was necessary to control for a reasonable sample size. My purpose in this study was not to

generalize results to all U.S. colleges and universities, however, but to explore barriers to analytical tool adoption specifically at College Z (Creswell, 2012). I selected the participants in the sample size based on the following criteria: (a) had student- and faculty-driven measurable key performance indicators and (b) worked in an academic department.

I contacted and worked with the human resource department to obtain a list of criterion-based participants. Personnel at the human resource department provided a list of participant names, work phone numbers, and work e-mail addresses (see Appendix A). Of this pool, the sampling size was random as it was self-selected and voluntary. I conducted this purposeful random sampling from the criteria-established pool to add credibility and reduce researcher bias (Creswell, 2012; Englander, 2012).

The next step I took was to review the guidelines for participant size in a phenomenological study. Creswell (2012) suggested that for a phenomenology study, collecting in-depth data involves participants ranging from three to 10 subjects. Twenty-five individuals located in academic divisions throughout the college qualified for the study. As my intention with the study was to serve as a representation of all United States colleges and universities and their barriers to analytic adoption, Merriam (2009) suggested a small information-rich sample size in which a deep understanding could be achieved. Drawing from this logic a sample size of 40%, I chose a percentage that obtained saturation, equaling 10 participants.

I sent a letter describing the research and the request for an interview to the participant pool through the college e-mail system (see Appendix B). The letter gave an

overall summary of the research, why I needed an interview, the estimated time it would take for the interview, and a strict notice of confidentiality. The letter asked the participant to contact me if the possible participant was willing to grant an interview. I then sent the first 10 responses closed the sample and a follow-up e-mail to all participants in the pool, stating that I had reached the required research pool size. This e-mail thanked the possible participants for any consideration they had given to take part in the study (see Appendix C). I then e-mailed a letter to the 10 interview participants thanking them for agreeing to participate, and describing the research, interview process, and purpose in more detail. The letter asked availability of days and times in which to schedule the interview (see Appendix D). I also attached the interview questions so that participants could review the questions and form thoughts about the subject matter (see Table 4).

Interview Process

All interviews were held in the office or a predetermined space identified by the interviewee. I opened each interview by asking the interviewees whether they were comfortable with questions regarding the use of analytic tools and information technology in the management of the interviewee's activities, and to remind them that I would record the interview for transcription purposes. I reminded the interviewee that the interview was voluntary and that the interviewee could stop the interview for any reason at any time. I took minimal field notes and depended on the computer recording software for later in-depth transcription.

I asked the interviewees whether there were any other comments or clarifications needed before the closure of the interview sessions. I reminded the interviewees that I would send a full transcription to the interviewees to review, clarify, and make any comments as deemed necessary. I thanked each interviewee for their time and gave a date at which I would send their transcription to them for follow-up review.

Instrumentation

The instrumentation used in the study included two previously published studies. Creswell (2012) suggested the use of interview questions designed and validated in previous studies to maximize credibility, to use as a foundation, background, and strategy. I used two studies, namely Ali and Magalhaes (2008), and Venkatesh and Bala (2008). I used the interview questions from Ali and Magalhaes' study as a base of comparison to the interview questions from Venkatesh and Bala's study. I modified the questions from Venkatesh and Bala's study to meet the needs of this study. Modification of the instrument involved the expansion of the concept of IT barriers from the original instrument and the addition of newly designed and appropriate context detailed questions to better describe the appropriate academic analytic tool term used for this study.

I provided comments to give participants a general background for each question and to ensure participants had an accurate interpretation of each question, and that I clearly understood the meaning of the participant's response. The use of the comments helped maximize credibility (Creswell, 2012).

The open-ended interview approach reduced interviewer bias, and permitted evaluation of the collected data to be easily compared and analyzed (Creswell, 2012).

Face-to-face interviews allowed the interviewees to respond in-depth. I used a recorder imbedded in a laptop computer so I would be able to concentrate on making the participant(s) comfortable with adequate eye contact and to encourage the participant(s) to speak and share ideas freely (Creswell, 2012). The interviews allowed for an exhaustive exploration into barriers of academic analytic adoption at College Z.

Published Instrument

Ali and Magalhaes (2008) conducted a study in Kuwait with a sample of human resource managers and IT development managers to determine barriers of an IT adoption platform. In this context, Ali and Magalhaes' case study was appropriate to use for comparison purposes and as a foundational tool for this study.

Ali and Magalhaes' (2008) interview tool was validated through the systematic use of a previously published query list to guarantee internal validity, credibility, and authenticity. Additionally, Ali and Magalhaes conducted a pilot study to further validate the chosen interview instrument. The researchers established content and internal validity through the pilot study (Ali & Magalhaes, 2008). See Appendix E for permission to reprint the Ali and Magalhaes interview protocol.

1. To what extent is e-learning used in your company? Who are the users, who are the providers and what is the range of courses covered through e-learning? This question relates to the following research question in this current study: Are academic administrators aware of how academic analytics could help manage key performance indicators? The theme that resulted: There is an

awareness of analytics and analytic tools at the college. The finding that resulted: Climate and Policy are barriers to adoption.

2. How closely does the organization's training policy fit with e-learning? Did the use of learning technologies raise the standards of employee's performance? How prepared is your organization to deal with the large and increasingly complex e-learning marketplace? This question relates to the following research questions in this current study: Are academic administrators aware of how academic analytics could help manage key performance indicators? What types of discrete databases are currently used by academic administrators to help the management of their perspective departments? The theme that resulted: Technologies currently used to manage key performance indicators. The finding that resulted: Possible infrastructure and policy are barriers to adoption.
3. What challenges does the organization face in the setting-up and/or implementation of e-learning? From your organization's experience, what are the top 3 barriers of starting/implementing e-learning? This question relates to the following research questions in this current study: Does the climate of a secondary education institution hinder the adoption and use of analytic tools, or are there funding/investment issues? And also, would college academic administrators use academic analytics to help increase student success and other managerial tasks? The theme that resulted: Investment of analytic tools. The finding that resulted: Climate of the college may be a barrier to adoption.

4. Taking into consideration the challenges both employers and employees encounter: (1) Is e-learning worth the investment? If yes, explain. This question relates to the following research questions in this current study: Does the climate of a secondary education institution hinder the adoption and use of analytic tools, or are there funding/investment issues? And also, would college academic administrators use academic analytics to help increase student success and other managerial tasks? The theme that resulted: The theme that resulted: Investment of analytic tools. The finding that resulted: Climate of the college may be a barrier to adoption. (Ali & Magalhaes, 2008, pp. 38-39)

I reviewed and modified an additional interview instrument for this study. Venkatesh and Bala (2008) explored barriers to IT implementation in companies and institutions. Venkatesh and Bala designed the longitudinal field study to determine the perceived usefulness and the perceived ease of use of an IT implementation from employees working at four different organizations (Venkatesh & Bala, 2008).

Venkatesh and Bala (2008) used constructs validated from the Technology Acceptance Model 2 study and operationalized it in a prior study. Questions regarding barriers to IT implementation brought forth from the 2008 study were appropriate for this study with appropriate modifications for specific content. See Appendix F for permission to modify instrument.

1. What specific design characteristics will influence the determinants of perceived usefulness and perceived ease of use? This question gives a broad umbrella of usefulness and awareness related to this current research question:

Are academic administrators aware of how academic analytics could help manage key performance indicators? The theme that resulted: There is an awareness of analytics and analytic tools in higher education. Finding that resulted: Climate and policy may be barriers to adoption.

2. What are the effects of the different ways of user participation on the key determinants of perceived usefulness and perceived ease of use and consequently, perceived usefulness and perceived ease of use? This question relates to the following research question: How can knowledge management tools enhance the efficiency of a higher education institution? The theme that resulted: How analytics can help with the management of key performance indicators. The finding that resulted: Training issues may be a barrier to adoption. And also this question relates to the following research question: What types of discrete databases are currently used by academic administrators to help the management of their perspective departments? The theme that resulted from this question: Technologies currently used to manage key performance indicators. The finding that resulted: Policy and infrastructure may be barriers to adoption.
3. What forms of management support are important in creating favorable perceptions toward a new system? This question relates to the following research question in the current study: Does the climate of a secondary education institution hinder the adoption and use of analytic tools, or are there funding/investment issues? The theme that resulted from this question was:

> Investment of analytic tools. The finding that resulted: The climate of the college may be a barrier to adoption. (Venkatesh & Bala, 2008, pp. 275-276)

Developed Instrument

I based the development of the interview protocol for this study (see Table 4) on the prior studies by Ali and Magalhaes (2008), and Venkatesh and Bala (2008). Both studies investigated barriers to IT implementation. Ali and Magalhaes (2008) developed their study to discover IT implementation barriers in an academic setting. Venkatesh and Bala (2008) focused on discerning IT implementation barriers and perceived usefulness.

I established content validity for the interview protocol for this study using a pilot study. I chose three participants for the pilot study. I gave the interview to the participants in the exact manner in which I conducted the main study. I asked the participants in the pilot study questions regarding the content of the interview questions. I asked (a) did each question made sense to them, (b) was each question clearly stated, and (c) was there a better way to state the question? I recorded their responses and made improvements to the interview questions.

Interview Protocol Used in Pilot Study

1. Can you think of how you use information technologies in the management of your daily activities? Used to explore the research question: Are academic administrators aware of how academic analytics could help manage key performance indicators?
2. What are your primary key performance indicators/goals? Used to ensure the participant met the criterion-based selection process.

3. Describe how you manage your primary key performance indicators/goals? Used to explore the research question: Are academic administrators aware of how academic analytics could help manage key performance indicators?
4. What is your position within the organization? How long have you worked for the organization? Used for demographic information.
5. Describe the kinds of data you use in order to manage your performance indicators/goals. Used to explore the research question: What types of discrete databases do academic administrators currently use to help the management of their perspective department?
6. What kinds of IT support do you believe would help you accomplish your goals more effectively? Used to explore the research question: How can knowledge management tools enhance the efficiency of a higher education institution?
7. Describe your experience using technology to reach or exceed your performance goals. Used to explore the research question: Are academic administrators aware of how academic analytics could help manage key performance indicators? Also used for background information.
8. Describe any training you have received in the usage of technology in your workplace. Used for background information.
9. Do you believe the use of technology in academic management is worth the investment? Please explain. Used to explore the following research questions: Does the climate of a secondary education institution hind the adoption and

use of analytic tools, or are there funding/investment issues? And also, would college administrators use academic analytics to help increase student success and other managerial tasks?

10. If you do not use data and analytics to help manage your key performance indicators, can you explain why not? Used to explore the following research questions: Does the climate of a secondary education institution hinder the adoption and use of analytic tools, or are there funding/investment issues? Would college administrators use academic analytics to help increase student success and other managerial tasks?

Pilot Study

I conducted the pilot study for several reasons. First, I used it to control for validity. Secondly, I viewed it as valuable in that I asked the subjects of the pilot study for feedback to identify vagueness in questions, and to identify difficult questions. Third, I was able to record the time it took to complete the interviews. Fourth, I was able to re-word ambiguous questions and discard unnecessary questions. I administered the interviews in the same manner in which I conducted the main study.

I drew participants for the pilot study from academic managers, meeting the same criteria as the main study, who worked for a different college: College X. I recruited College X participants using a snowball purposeful sampling technique. This technique allowed me to speak to information-rich criterion-met persons, while extending the pilot to similar participants without the use of the ancillary resources garnered from College X (Creswell, 2012; Merriam, 2009).

College X's website identified Participant A as an academic manager. I sent an e-mail inquiring whether participant A would be interested in participating in the pilot study (see Appendix G). At the time of the interview, I asked Participant A for names of persons who met the interviewee criterion and who would possibly be interested in participating in the pilot study.

I was the sole data collector. I used a laptop-imbedded recorder, and took field notes during the interview. I gave the participants information regarding the intent of the pilot study, as well as the purpose of the main study. I gave the interviewees the interview questions ahead of time, and asked whether they had questions about the interview prior to the scheduled interview. I asked the participants about the structure of the questions, their understanding of the questions, and to suggest any improvements. See Appendix H for the IRB approval number.

Data Collection Procedures

I used interviews to explore barriers to the adoption of analytic tools in a higher education organization. The interview questions were adapted and modified to meet the needs of this study (Venkatesh & Bala, 2008). The individuals interviewed met criteria based on their academic management roles. In the event that there were fewer participants due to unexpected circumstances, I could have easily contacted members from the original list of prospective participants.

The interviews took place in the office of the individual participants; this was necessary, as the time an academic manager would lose leaving campus was valuable. The use of the open-ended questions allowed for the participants to expand their answers

if they wished. It allowed me to elicit further information if there was an opportunity. I used a built-in laptop recorder to record the interviews, and I took field notes during interviews.

I reminded the participants at the time of the interview that their interview was voluntary and that I would keep all confidentiality in place. I reminded the participants that they could refuse without reason, to answer any question. I told the participants that they would be able to review the transcript of their interview to make certain that I recorded their answers appropriately.

I conducted the interviews within a period of four weeks. I scheduled each individual participant for the interview at his or her convenience. I transcribed and encoded the data collected during the interviews using the computer software MAXQDA, see Appendices I, J, K, L for samples.

When the participants exited the interview session, I asked each interviewee again to verify their contact information. I did this so that I could send the transcribed interview to the interviewees for review. I sent the transcribed interviews to the participants, by e-mail, so that they could make any adjustments they feel necessary.

Data Analysis

To explore barriers to adoption of analytic tools in College Z, I used data gained from the in-depth interviews of academic managers. The goal of this data collection was to obtain a deeper understanding of the factors that inhibited educational managers from using analytical tools to help increase key performance outputs. I recorded and transcribed each interview word for word to perform initial coding (Creswell, 2012).

I built the main categories of the study from the main research questions (Schreier, 2012). I then derived the main categories from the coding frame. I accomplished the coding frame by analyzing the content exhaustively (Schreier, 2012). I chose conventional content analysis for this study based on the phenomenological approach to the research question (Creswell, 2012).

To answer the research question described in the study, I developed categories from significant statements in the interviews (Creswell, 2012). I then expanded the categories into themes, or codes, which explored barriers in the adoption of analytical tools (Creswell, 2012). The modified interview protocol safeguarded an equivalency between the research questions and the interviews (Venkatesh & Bala, 2008).

Data analysis included the use of the MAXQDA qualitative software analysis tool. I recorded the interviews using Apple's MacBook Pro software and an imbedded microphone. I will store all collected documents, and I will destroy said documents after five years to ensure participant confidentiality.

Trustworthiness

I established credibility using member checks and peer review (Creswell, 2012). I returned the transcribed interview sessions to each individual participant. In this manner, I gave the participants the opportunity to adjust faults they found in the transcription. Afterward, I gave them the themes that resulted from their session. This provided the participants an occasion to challenge results, add information which they may have omitted during the interview, or explain any misunderstanding (Creswell, 2012).

Peer review added credibility to the study. I met with a researcher outside of the organization under study to debrief the interview notes. I also took notes and reviewed these notes during the debriefing sessions (Creswell, 2012). I discussed methods, procedures, understandings, and feelings to make sure that I had an outside review of the research (Creswell, 2012).

A rich description was adapted to describe the setting and the participants' interview session. This was done for readers of the research to "transfer information to other settings and to determine whether the themes can be transferred" (Creswell, 2012, p. 209). The use of thick description aided in external validity of the study (Creswell, 2012). This in-depth, rich description also established dependability of the research. The exhaustive coverage allowed readers to repeat the procedures and methods used in this study in another study with some understanding that they may find similar results (Lietz & Zayas, 2010).

Because of the difficulty in ensuring real objectivity in cases where humans interact with humans as in a qualitative study, I considered the participants' experiences and impressions brought forth from the interviews (Merriam, 2009). To control for personal biases and personal experiences, I kept notes unembellished. Additionally, I kept writing clear and concise with objectivity as an overall goal (Creswell, 2012).

Ethical Procedures

I obtained access to interview participants for this study from the appropriate departmental manager at College Z (see Appendix M). This process involved e-mailing the manager to obtain an informal meeting to discuss the study. During the meeting, I

explained in detail the manner and purpose of the study. The manager then e-mailed an approval to use College Z for data collection.

I obtained approval from Walden University through the IRB. The IRB approval number for this study is 01-28-14-0231112 and is valid through January 27, 2015 (see Appendix H).

I e-mailed each participant a consent form with details regarding the treatment of humans in a research study (see Appendix N and Appendix O). The consent form assured the participants of confidentiality, the right to withdraw from participation at any time, up to, during, or before the publication of the study. It stated that I would provide the interviewees with the transcripts of their interview, and that I would ask them to review for any errors. I further asked participants to read the consent form, and sign and return it to me prior to scheduling the interview. Once I received the consent form(s), the participant(s) were contacted in order to schedule the interview.

To address further issues of ethical concerns, I gave no therapy to the participants. Questions from the interview did not ascertain humiliating or hostile information. The interviews were private and confidential (Creswell, 2012). There were no incentives given for participation in the study. I informed participants that I would store all interview documents and recordings, and that I would destroy said documents after 5 years to safeguard confidentiality. Furthermore, although I conducted the study at my place of employment, I have little to no contact with the interviewees or the content or subject matter of the research within the College. My role at College Z does not intersect with the issues brought forth in this study.

Summary

Researchers showed that the use of analytic tools improved key outcomes and accountability measures for colleges (see Chapter 2). However, higher education institutions are slow to adopt these proven tools (see Chapter 2). In this study, I explored the barriers to the adoption of analytic tools in College Z. The exploratory nature of the study led me to choose a qualitative method for the research. The intent of conducting such a study was to ensure an in-depth examination of data collected at College Z.

I took measures to ensure privacy of the participants of the study. I safeguarded credibility and validity through peer reviews and member checks. I provided external validity by gathering detailed information from participants. I mitigated ethical concerns using consent forms and approval of the IRB. In the next chapter, Chapter 4, I present the data collected following this prescriptive chapter.

Chapter 4: Results

Introduction

The purpose of this phenomenological study was to explore the factors that inhibited higher educational institutions in their adoption of proven analytic tools to help improve management of key performance indicators. I interviewed academic managers at a community college to explore their perspectives of this phenomenon. I used open-ended interview questions to gain a greater understanding of the experiences and perceptions of academic managers at College Z. The interviews allowed for an exploration into barriers of academic analytic adoption at the institution. The general research question that guided this study was the following: What factors impede the implementation of academic analytic tools in a higher education setting? Subsequent guiding questions included

1. Are academic administrators aware of how academic analytics could help manage key performance indicators?
2. What types of discrete databases do academic administrators currently use to help the management of their perspective departments?
3. How can knowledge management tools enhance the efficiency of a higher education institution?
4. Does the climate of a secondary education institution hinder the adoption and use of analytic tools or is there an investment/monetary issue?
5. Would college administrators use academic analytics to help increase student success and other managerial tasks?

In Chapter 4, I include a detailed description of the manner in which I conducted, recorded, and transcribed the interviews. I also present the analysis and results of the interviews. The final section contains a summary of the results representing and relating to each participant. Open-ended interviews provided an opportunity to explore the perspectives of academic managers at a higher education institution.

Pilot Study

I drew participants for the pilot study from academic managers who met the same criteria as the main study and who worked for a different college, namely College X. I recruited College X participants using a snowball, purposeful sampling technique. This technique allowed me to speak to information-rich criterion-met persons, while extending the pilot to similar participants without the use of the ancillary resources garnered from College X (Creswell, 2012). I identified Participant A through College X's website as an academic manager. I sent an e-mail inquiring whether participant A would be interested in participating in the pilot study (see Appendix G). Participant A agreed to be a participant in the pilot study. At the time of the interview, I asked Participant A for the names of persons who met the interviewee criteria and who would be interested in participating in the pilot study. Participant A gave two other names of persons who met the criteria.

I held the interviews at quiet, off-campus locations near the college that the participants could easily access. I gave the participants information regarding the intent of the pilot study, as well as the purpose of the main study. I also gave the interviewees

the interview questions ahead of time, and I asked if they had questions about the interview prior to the scheduled interview.

I recorded interviews using a computer laptop, and I took sparse field notes. I conducted the interview in the exact same manner in which I conducted the main study. Directly after the interview, I asked the participants about the structure of the questions, their understanding of the questions, and to suggest any improvements. I asked the following interview questions.

Original Interview Protocol

1. Can you think of how you use information technologies in the management of your daily activities? Used to explore the research question: Are academic administrators aware of how academic analytics could help manage key performance indicators?
2. What are your primary key performance indicators/goals? Used to ensure the participant met the criterion-based selection process.
3. Describe how you manage your primary key performance indicators/goals? Used to explore the research question: Are academic administrators aware of how academic analytics could help manage key performance indicators?
4. What is your position within the organization? How long have you worked for the organization? Used for demographic information.
5. Describe the kinds of data you use in order to manage your performance indicators/goals. Used to explore the research question: What types of discrete

databases do academic administrators currently use to help the management of their perspective department?

6. What kinds of IT support do you believe would help you accomplish your goals more effectively? Used to explore the research question: How can knowledge management tools enhance the efficiency of a higher education institution?
7. Describe your experience using technology to reach or exceed your performance goals. Used to explore the research question: Are academic administrators aware of how academic analytics could help manage key performance indicators? Also used for background information.
8. Describe any training you have received in the usage of technology in your workplace. Used for background information.
9. Do you believe the use of technology in academic management is worth the investment? Please explain. Used to explore the following research questions: Does the climate of a secondary education institution hind the adoption and use of analytic tools, or are there funding/investment issues? And also, would college administrators use academic analytics to help increase student success and other managerial tasks?
10. If you do not use data and analytics to help manage your key performance indicators, can you explain why not? Used to explore the following research questions: Does the climate of a secondary education institution hinder the adoption and use of analytic tools, or are there funding/investment issues?

Would college administrators use academic analytics to help increase student success and other managerial tasks?

The participants gave feedback regarding the term technology, and they suggested that, because the meaning may have multiple interpretations, I should consider changing the term to better reflect the description of academic analytics as defined in the study. I completed the pilot study using the original interview protocol; however, I asked the following two participants about the use of academic analytics instead of technology to remain closer to the defined concept. The remaining two participants agreed that the use of technology was overly broad. I made the slight wording change to the original interview protocol to use in the regular study.

Revised Interview Protocol

1. Can you think of how you use academic analytics in the management of your daily activities?
2. What are your primary key performance indicators/goals?
3. Describe how you manage your primary key performance indicators/goals.
4. What is your position within the organization? How long have you worked for the organization?
5. Describe the kinds of data you use in order to manage your performance indicators/goals.
6. What kinds of IT support do you believe would help you accomplish your goals more effectively?

7. Describe your experience using technology to reach or exceed your performance goals.
8. Describe any training you have received in the usage of analytics in your workplace.
9. Do you believe the use of academic analytics in academic management is worth the investment? Please explain.
10. If you do not use data and analytics to help manager your key performance indicators, can you explain why not?

The pilot study allowed me to improve upon the interview protocol and discover the length of the interviews to allow an average period for the main study interviews. The pilot study also gave me the opportunity to make certain the laptop recording device worked as believed. The recording laptop worked as planned.

I transcribed, verbatim, each interview and e-mailed it back to myself in Word format. I listened again to each interview while reviewing the transcription. I only made slight changes. I then e-mailed each transcription to the participants. I asked the participants to read the transcription to ensure that the meaning of the interview was as the participants wished. Each participant reviewed their transcript and added nothing else to the transcription.

Settings

None of the participants disclosed any personal or organizational condition that they felt might have influenced their responses. Some participants noted that a new strategic planning cycle was occurring at the pilot study site; however, this was at the

macro level of discussion, and the use of academic analytic tools at the micro/unit level was not at the level of discussion.

Demographics

I conducted 10 interviews for the main study. The human resources department of College Z provided a list of personnel who met the academic management criteria requirements. The participants represented all six campuses from academic divisions such as Liberal Arts, Science, Business and Technology, Humanities, and Mathematics.

Data Collection

The participant size for the study was 10 academic managers based on criterion sampling. I used criterion sampling to elicit responses from managers in an academic higher education setting. Academic managers are persons whose key performance indicators include student retention, faculty training and observation, managing full time equivalent budgetary operations, curriculum reviews, and policy compliance. Criterion sampling can be important when reviewing quality assurance endeavors and as in this study, an extensive exploration into academic analytics (Creswell, 2012).

For the participants to remain confidential, I assigned each participant's interview with a code. I used a random code generator that included eight characters, upper and lower-case, and numbers. I removed characters that look similar on screen, such as I, 1, O, and 0. The codes were generated using randomcodegenerator.com.

I e-mailed a structured interview protocol to each participant. Included on the protocol were the 10 open-ended questions. The questions allowed the participants to share their insights, observations, and beliefs regarding the use of academic analytics and

technology in the management of their key performance indicators. I conducted each interview in the office of the participant. The interviews lasted an average of 20-30 minutes.

I recorded each interview using a laptop. There was no external microphone in use. The pilot study ensured the superior quality of the internal microphone in the laptop. I e-mailed each interview to an online transcription service named Rev.com. The transcription service returned the verbatim transcription in Word format within 24-48 hours. I listened to the interview while reviewing the transcription to ensure quality of the transcribed interview. Listening to transcriptions revealed no unusual circumstances, as the transcriptions were extremely accurate. I then e-mailed each transcribed Word document to each respective participant. I asked the participants to review their transcribed interviews and to identify any changes or additions they would like to append. Participants identified no substantial changes.

Data Analysis

I reviewed the interviews the first time during the interview. I then listened to the recorded interview again to ensure the quality of the recording and to ensure the accurate length of the interview. I then uploaded the audio to the transcription service, Rev.com, to have a complete verbatim transcription compiled on a Word document. This process took an average of 24-48 hours.

Once I received the transcribed Word documented interview, I listened to the audio interview again to compare the transcription to the interview in order to make sure of accuracy of the transcription. I e-mailed each transcription to the respective participant

for a final examination and verification. I then imported the resulting verified transcription in Word document format to the qualitative data analysis software MAXQDA. I reviewed the transcriptions once again as they were imported into the software. This review helped me recognize and triangulate the opinions and experiences from each of the participants.

I analyzed the interviews with the organizational support of the MAXQDA qualitative data analysis software. MAXQDA software allowed me to easily code, sort, set up categories, and discover themes within a large amount of transcribed data. I was able to extract phrases and key words, and was able to mark with symbols, color codes, and emoticons, where appropriate.

The process I used to move from individual coded units to larger representative themes was the application of the Moustakas method described by Creswell (2012).

The analysis included the following steps:

1. Listing and preliminary grouping.
2. Reduction and elimination.
3. Clustering and thematizing the invariant constituents.
4. Final identification of the invariant constituents and themes by application: Validation.
5. Construct an individual textural description of the experience.
6. Construct an individual structural description of the experience.
7. Construct a textural-structural description of the experience

The first step, listing and preliminary grouping, was the process of listing each expression relevant to the experience (Creswell, 2012).

Preliminary Grouping

I reviewed each transcript and denoted selective text as it was germane to the research questions. Each selection of text was electronically marked using the qualitative data software application MAXQDA. With MAXQDA, I was able to organize the data to be efficient and logical.

The logical organization of the texts, as I marked them, resulted in an initial coding of the text interviews. I collected and linked these codes to the research questions in which they were relevant. This process allowed me to organize the textural data on an equal basis, thus performing horizontalization of the data (Creswell, 2012)

Reduction and Elimination

I followed the initial coding of the data with an intensive review of each individual invariant constituent to confirm validity. I reviewed the coded segments tested to confirm the relativeness to the central question of factors that impede the implementation of academic analytic tools in a higher education setting. This process involved the use of two questions (Creswell, 2012):

1. What has the participant experienced in reference to the phenomenon?
2. Is it possible to abstract and label it? If so, it is a horizon of the experience.

The first question, “What has the participant experienced in reference to the phenomenon?” involved the examination of the data to make sure the coded data linked

to the question of academic analytics in higher education. If I found the negative, I eliminated the invariant constituent.

The next step in the process was to check if I could abstract and label the coded data. I scrutinized the data once again to test whether the coded segments were ambiguous, repetitive, or unclear. If the coded discrepant segments matched these attributes, I removed them (Creswell, 2012). Because of the high organizational capabilities of the MAXQDA software, the application aided in this step. I then reserved the residual portions of this process and used these to build clusters.

Clustering and Theming the Codes

I grouped the residual data from the previous step into clusters or categories. I reviewed the invariant constituents to consider similar experiences as expressed by the participants. I examined the invariant constituents to determine whether I could unify them into distinct significant units of experience (see list below). I further used these core groups to group the experiences into major themes (Creswell, 2012). I identified the categories as enumerated below.

1. How could analytics help? Is it worth the investment? (This sentiment originated from the research questions “How can knowledge management tools enhance the efficiency of a higher education institution? Does the climate of a secondary education institution hinder the adoption and use of analytic tools? Would college administrators use academic analytics to help increase student success and other managerial tasks?”)

2. Currently using analytics (This sentiment originated from the research question “Are academic administrators aware of how academic analytics could help manage key performance indicators?”)
3. Why is participant not currently using analytics? (This sentiment originated from the research question “Does the climate of a secondary education institution hinder the adoption and use of analytic tools?”)
4. Training (This sentiment originated from the research question “Would college administrators use academic analytics to help increase student success and other managerial tasks?”)
5. Types of technologies used (This sentiment originated from the research question “What types of discrete databases are currently used by academic administrators to help the management of their perspective departments?”)
6. Types of data used (This sentiment originated from the research question “What types of discrete databases are currently used by academic administrators to help the management of their perspective departments?”)
7. Key performance indicators (This sentiment originated from the research question “Are academic administrators aware of how academic analytics could help manage key performance indicators?”)
8. Disappointments (This sentiment originated from the research questions “What types of discrete databases are currently used by academic administrators to help the management of their perspective departments? How can knowledge management tools enhance the efficiency of a higher

education institution? Does the climate of a secondary education institution hinder the adoption and use of analytic tools or is there an investment/monetary issue? Would college administrators use academic analytics to help increase student success and other managerial tasks?")

Final Identification of Themes

According to Creswell (2012), the identification of the final themes of the study requires validation of the invariant constituents to the actual transcript of the participant. Comparing each coded invariant and the subsequent category to the transcript of each participant helped with validation (see list below).

1. An awareness of analytics and analytic tools in higher education. The research question that correlates to this theme is, "Are academic administrators aware of how academic analytics could help manage key performance indicators?"
2. Technologies currently used to manage key performance indicators. The research question that correlates to this theme is, "What types of discrete databases do academic administrators currently use to help the management of their perspective departments?"
3. Analytics and analytic tools to help with the management of key performance indicators. The research question that correlates to this theme is, "How can knowledge management tools, such as analytics and analytic tools, enhance the efficiency of a higher education institution?"

4. Investment of analytic tools. The research question that correlates to this theme is, “Does the climate of a secondary education institution hinder the adoption and use of analytic tools or is there an investment/monetary issue?”
5. Current use of analytic tools. The research question that correlates to the theme is, “Would college administrators use academic analytics to help increase student success and other managerial tasks?”

Individual Textural Descriptions

Textural descriptions were used to describe how participants felt about and their experience in the use of analytics in their particular management activities in higher education. Creswell (2012) recommended the use of verbatim examples to develop individual textural descriptions. I achieved this step by describing each participant’s inclusive experience using analytics in their day-to-day activities of managing an academic unit at a higher education organization.

Individual Structural Descriptions

I represented individual structural descriptions through the combination of individual textural descriptions and imaginative variation (Creswell, 2012). I examined the individual structural descriptions from reflections, analysis, and perspectives to arrive at structural descriptions. I undertook this by portraying the comprehensive understanding of each participant from the meaning of the individual coded text.

Textural-Structural Descriptions

I collected a textural-structural description using both the individual textural descriptions and the individual structural descriptions. I developed this description, which

characterized a mixture of the combined analysis of textural and structural descriptions, from the analyses of the meanings and elements of the individual participant's experiences of the use of analytics in the individual participant's management activities. Finally, I developed a group, or composite description combining the individual textural-structural descriptions (Creswell, 2012).

Evidence of Trustworthiness

I verified credibility using member checks and peer review (Creswell, 2012). I returned the transcribed interview sessions to each individual participant. I gave participants the opportunity to read the interview session and make comments or clarification as they saw necessary (Creswell, 2012).

I also allowed the conducting of peer review to add credibility to the study (Creswell, 2012). I met with a peer researcher outside of College Z. I took notes during the debriefing sessions (Creswell, 2012). We discussed methods, procedures, understandings, and feelings to make sure that I gained an outside review of the research (Creswell, 2012).

I used a rich description to describe the setting and the participants interview session. This was done for readers of the research to "transfer information to other settings and to determine whether the themes can be transferred" (Creswell, 2012, p. 209). The use of thick description aided in external validity of the study (Creswell, 2012). This in-depth, rich description also helped me establish dependability of the research. The exhaustive coverage will allow readers to repeat the procedures and methods used in this

study in another study, with some understanding that they may find similar results (Lietz & Zayas, 2012).

Results

I constructed 10 open-ended questions to explore the experiences of higher education academic managers at a community college and their thoughts and impressions on the use and nonuse of analytics in their workplace. The participants were criterion based drawn from a list provided from College Z (see Appendix A). Interviews took place at the offices of the participants at a time convenient for each participant. I transcribed each interview and analyzed the same using the qualitative software MAXQDA.

The major themes addressed the relevant research questions of this study. These questions are listed below:

Research Question 1. Are academic administrators aware of how academic analytics could help manage key performance indicators? The related interview question was, " Can you think of how you use information technologies in the management of your daily activities?" The theme that emerged was that there is an awareness of analytics and analytic tools in higher education. The finding that developed was that climate and policy may be barriers to the adoption of academic analytics at the college.

Research Question 2. What types of discrete databases do academic administrators currently use to help the management of their perspective departments? The related interview question was, "Describe how you manage your primary key performance indicators/goals?" The theme that emerged was the technologies currently

used to manage key performance indicators. The finding that developed was that policy and infrastructure may be barriers to the adoption of academic analytics at the college.

Research Question 3. How can knowledge management tools enhance the efficiency of a higher education institution? The related interview question was, "What kinds of IT support do you believe would help you accomplish your goals more effectively?" The theme that emerged was determining how analytics and analytic tools can help with the management of key performance indicators. The finding that developed was that training issues may be a barrier to the adoption of academic analytics at the college.

Research Question 4. Does the climate of a secondary education institution hinder the adoption and use of analytic tools or is there an investment/monetary issue? The related interview question was "Do you believe the use of technology in academic management is worth the investment? Please explain." The theme that emerged was the investment of analytic tools. The finding that developed was that climate may be a barrier to the adoption of academic analytics at the college.

Research Question 5. Would college administrators use academic analytics to help increase student success and other managerial tasks? The related interview question was, "If you do not use data and analytics to help manage your key performance indicators, can you explain why not?" The theme that emerged was that there is no current use of analytic tools. The finding that developed was that policy may be a barrier to the adoption of academic analytics at the college.

I describe the major themes in the individual structural descriptions of the participants.

Individual Structural Description for Participant mTXQRnmk

This participant had been an academic manager for two-and-a-half years. Participant mTXQRnmk believed that he/she uses analytics on a day-to-day basis. The participant experienced the use of running certain reports, if interested, through the college database. This participant stated, “Most institutions of higher education these days are very data driven, so getting the data from any kind of analytic tools, I think is very important.” Participant mTXQRnmk used Excel spreadsheets and the college website and databases when needed. When asked about the importance of data and analytics, the participant responded that investment in analytic tools is worth the investment “because it is such an evidence-based culture now, and everything’s data driven... you have to show data.”

Individual Structural Description for Participant E6UcdPac

Participant E6UcdPac has been with the college for four years. This participant says, “I can't think of any analytic tools that I use. I would love to have something that could help me, to manage my daily activities.” The administrator used the college database and website, along with e-mails, Excel, and Word documents to manage workload. Participant E6UcdPac discussed the need for some kind of analytic tool that would work together with each of the IT applications used on a daily basis to help minimize errors. This participant also added, “If there’s technology out there that can do that, that would be great.” This administrator stated, “I’ve got to be honest, this is the first

time I've heard more in terms of analytic tools…maybe no one has actually thought about that." Participant E6UcdPac believed, if available, analytic tools could help productivity.

Individual Structural Description for Participant hdt2odJ5

The participant hdt2odJ5 had been with the college for 12 years. This participant did not use analytics to help manage daily activities, stating, "There is no software that I use for that [management of key performance indicators], no software that I do know." Participant hdt2odJ5 believed that analytic tools could help with the management of performance indicators, stating,

> The concept is that then you would not have to run special reports. The reports would be there. When you come to metrics, technology is a tool. If you don't have the metric systems in place, then the technology is useless. Now the college does not really, I feel, have a system of metrics in making decisions based on metrics.

This participant relied on team members to query reports and pull them together on Excel spreadsheets that the participant then e-mailed. The administrator believed that "the college has to provide the leadership and the alignment" and that an adoption has to come "from the [redacted] [name of the 23 college system that the college belongs] down to the college down to the campuses."

Individual Structural Description for Participant pvofSD7u

The pvofSD7u participant had been with the college for seven years. This administrator used the college database, college website, the student [administrative] database, e-mails, and spreadsheets as the primary tools to manage key performance indicators. The participant stated,

> Most of what I do [to manage key performance indicators] is I pull reports and put them into spreadsheets. I may privately use software purchased in simulation models or in different, object driven models, to help me get a handle on something, but it's not provided by the college.

The participant did speak of a system that delivered reports to users, but stated, "The data in the system is not timely and not accurate. So if you have a dashboard that is giving you data that was accurate as of 6 weeks ago, that could be a problem." Participant pvofSD7u, when asked if analytic tools would help the management of key performance indicators, responded,

> There oughta be a way I can either give you a picture or words or numbers to help you make decisions and right now the only way to get there is to sit down and do your own private, very labor intensive study.

Individual Structural Description for Participant Ti4eKAN8

This participant had been with the organization for 29 years, and in an academic management position for seven years. Participant Ti4eKAN8 used primarily Word documents, the college website, the college database which houses student and curriculum data, and an extensive list of outside websites to manage key performance indicators. When asked about the use of analytic tools to help manage daily activities, the participant responded, "I don't have access to analytical tools. That would be very helpful." Participant Ti4eKAN8, when asked if analytic tools could help manage key indicators, said, "If this [manually created Word document] would come up in front of me every morning …and be updated and by order of last touch and maybe having yellow

or orange alerts," that would be helpful. This participant added that there was not an awareness of these tools and that, if given the opportunity, he/she would look for better tools to help manage key goals.

Individual Structural Description for Participant 8d7RyjFS

Participant 8d7RyjFS had been with the organization for 39 years, and had been an academic manager for eight years. This manager relied on teammates to query reports and download them into an Excel Spreadsheet for dissemination. Tools regularly used included Excel, Word, e-mail, college database, and the college website. This participant expressed that analytics would not be useful to him/her because "I can trust my judgment on things often without checking the data just because I know what's likely to happen." The administrator added, "I need to clarify, [I believe] technology changes rapidly that when I did go through training, six months later I found out that my training was obsolete." When asked if an analytic tool could help with the management of key performance indicators, Participant 8d7RyjFS did admit that, "There are technologies that are useful and I can say that this printout from [redacted] [college database] which gives me class by class statistics, it would take me hours, if not, weeks to do that by hand."

Individual Structural Description for Participant cudkDAWQ

Participant cudkDAWQ had been with the organization for 17 years and in the current administrative position for a year and a half. This participant relied on an individual in a different department to e-mail information on an Excel spreadsheet to help manage performance indicators. The participant mentioned, "Normally, it's [the Excel

spreadsheet] coming to us almost too late to do much about it." This administrator admitted to not having analytic tools to help with management activities, stating,

> We have very primitive tools to do it [manage key performance indicators]. The fact that it's one person sitting in an office, for the front-end part, determining what our efficiency would be, that's pretty primitive. Where also, that person is very … I want to say … hard-working, very cooperative, but Excel is limited in what it can do.

Participant cudkDAWQ discussed that this administrator received information from a separate department, but the information is 6 months old, and the department querying the information is "centralized" and "…a very closed part of our organization. We have a very difficult time to get information from them [the centralized data controlled department] as well…frequently the requests that we make are not honored." This participant believed that analytic tools would be of great use for the management of key indicators, but stated that bureaucracy was a barrier in the adoption of any analysis or analytic tools.

Individual Structural Description for Participant rn73xv8V

Participant rn73xv8V had been with the college for 16 years. This participant depended on reports queried from a separate department. Using these reports, the participant extracted information and built formulas in Excel spreadsheets and then e-mailed them for dissemination. The participant used key college databases and websites to gather information. Regarding the use of analytic tools to help manage performance indicators, participant rn73xv8V believed,

> Education is becoming so complex and so reliant upon databased decision-making that anything that will screen the plethora of resources and the sea of information that's out there has got to be helpful. We don't have time to spend on it by looking at a lot of different databases or other resources.

The participant believed that the college has not adopted analytic tools for its academic managers because there is very little knowledge of what is available. The participant added that the use of analytics, a program that could gather important data that is used to perform tasks, and push it visually (dashboard on computer), and update constantly, would be useful, but only if it saved time.

Individual Structural Description for Participant stL64BGZ

Participant stL64BGZ had been with the organization for two years. This participant looked at several different databases and websites, within and outside of the college, to manage key performance indicators. Pertaining to the use of analytic tools in the workplace, participant stL64BGZ stated "There are some new programs out that help you visualize large amounts of data...they allow you to cut data vertically, horizontally, diagonally, in three dimensions," but that the organization did not currently have access to any tools as such. The participant believed that the use of analytic tools for academic managers is "…more than worth the investment. If you are not data driven, forget it. You can't run a college with a large amount of public dollars on anecdotes." This participant believed that bureaucracy and size of the college prevented the adoption of analytic tools.

Individual Structural Description for Participant JMLZXbUh

Participant JMLZXbUh had been with the college for 31 years. This participant used, along with the college website and databases, a book of reports published through a different department. The participant believed that the information in the book was a "wonderful resource," but that it was a static report and its information was usually a few years old by time of publication. When asked if an analytic tool would be beneficial in the management of daily goals and key performance indicators, participant JMLZXbUh stated,

> Yes, absolutely I do because I think that in Higher Ed we have a tendency to make decisions based on our gut, and that's just wrong. A lot of times we aren't aware that there are problems until they are so significant that we can no longer ignore them. Had we been looking at things, had it been easy for us to study data from day to day, or at least from month to month, we would have noticed there was a problem ahead of time and maybe we could have avoided it.

Participant JMLZXbUh believed that the college did not adopt analytic tools because, "There's a sense that because people are likely to misunderstand data it's better for them not to have them at all."

Textural-Structural Descriptions: "Themes"

I developed this description, which characterizes a mixture of the combined analysis of textural and structural descriptions, from the analysis of the meanings and elements of the individual participant's experiences of the use of analytics in the individual participant's management activities. In the following sections, I describe the

major themes of the study through the perceptions of the participants. I also identify the major themes that developed from the respective research questions, after which the themes are described in detail.

There is an awareness of analytics and analytic tools in higher education. I developed this theme from the research question: Are academic administrators aware of how academic analytics could help manage key performance indicators? Only two participants were not aware of analytics, or what analytic tools could do for higher education organizations. Eight participants stated they knew of analytic tools, and had seen analytic tools in other venues. They described how they had seen dashboards to control for their cell phone usage, and how they knew companies like Amazon used analytics to track purchases and give purchasing advice to customers. The participants were aware that they could use analytics in education to help track student achievement, student retention, and participation, and correlate information for better decision making. Participant mTXQRnmk believed, “Most institutions of higher education these days are very data driven, so getting the data from any kind of the analytics tools, I think is very important.” Participants stL64BGZ and cudkDAWQ both had extensive awareness of analytic tools. Participant stL64BGZ discussed analytic tools that can help “visualize [data] and you can do ‘what-if’ scenarios.” Participant cudkDAWQ stated, regarding analytic tools, “that these kinds of tools I know are available [and] could be available.” I found that the academic managers were aware of how analytics could help them in their day-to-day tasks, as well as their key performance indicators. The participants gave

instances whereby they believed an analytic tool such as a visualization dashboard could greatly help them achieve success.

Technologies currently used to manage key performance indicators. I developed this theme from the research question: What types of discrete databases do academic administrators currently use to help the management of their perspective departments? The top technology mentioned by most participants was the use of Excel spreadsheets. Most academic managers interviewed used various databases and websites to gather information. They would then transfer the information onto a spreadsheet, and then e-mail it to team members for further dissemination. Participant pvofSD7u stated, "Most of what I do is I pull reports and put them into spreadsheets."

Various websites and databases were the next most widely used technology employed by the administrators. Participant rn73xv8V stated using "Probably a half dozen or so [websites], most are budget. Others are enrollment or student information databases…a lot of the information that I need is found in the student database." Participant Ti4eKAN8 mentioned the use of several websites to collect information for one situation, and Participant stL64BGZ mentioned the use of five websites to collect information to follow trends. None of the participants said that they had a dashboard that collected and correlated information for them in real-time and displayed it visually so that the academic managers could have immediate, up to date information with alerts that aid in decision making.

How analytics and analytic tools can help with the management of key performance indicators. I developed this theme from the research question: How can

knowledge management tools enhance the efficiency of a higher education institution? The participants felt that they could use analytic tools, something similar to a dashboard, that when they came into work each morning, the dashboard would collect the information needed, update and correlate the information, and place the needed information in a visual graph that would enhance the understanding of the information. Participants discussed an example of registration time for semesters. Currently, a dean (academic manager) needs to manually check each section, each class, continually as students register for a particular class. The dean (academic manager) must closely keep watching each class to determine class population, and whether there is a possibility to open another section when the class reaches its maximum. If the academic manager, in this example, had the use of an analytic tool such as a visualized dashboard, this information would be pulled continuously and placed in a graph of sorts, and, as updated constantly, the graph could track course registration and give alerts, send e-mails, or change colors as the course reached different levels. This would help the academic manager better control the registration process, and would have the information needed to make timely decisions.

Participant JMLZXbUh understood how the use of an analytic tool could help with the management of key performance indicators, asserting,

> It would be helpful to use those technologies to really make it so that it was very specific to a program, and a program within a program like a specialization. Not just lumping everything together. It would also be good to actually use it to analyze. To pull two things together.

Participant rn73xv8V stated,

> If there was something that could just let me put in keywords and I could see key things so that I don't have to read the big three and I can focus on the ones that I really am concerned about. That's where I would prefer to spend my time rather than reading through a hundred page report and trying to figure out what's where.

Participants also saw the use of analytic tools to help with decision-making. Participant cudkDAWQ stated,

> Sometimes we make a decision not to do something because we've done it before, and it didn't seem to work. Whether if we actually looked at that … because as I well know, what you think you know might not necessarily be the case. The data might show something else, something that we weren't aware of. Because we've never had those tools, I can't say that we've been there.

For participant pvofSD7u, receiving the data would also help decisions, "If you give me the right information, I'll make better decisions."

Other participants stated the use of an analytic tool would perhaps provide real-time information. Participant JMLZXbUh discussed the use of an outdated report, stating, "Of course one of the problems is, this is two years old already by the time the fact book comes out." Participant cudkDAWQ mentioned that information gathered is sometimes not very timely, stating, "It's six months old by the time we get it, if even that." Participants said they would use the tools if given an opportunity.

Investment of analytic tools. I developed this theme from the research question: Does the climate of a secondary education institution hinder the adoption and use of

analytic tools or is there an investment/monetary issue? Participant E6UcdPac, when asked if the investment of an analytic tool would be a good idea, stated,

> I would say yes. If there's an analytic tool that can say, well take my job description, those key performances, those key tasks that are always evolving, that are always there. If there's something out there that can say…Well, this task here, which is faculty evaluations is coming up so you need to get that going or moving along or the schedule deadline is almost there. Something along those lines, I think would be worthwhile, it would be a good investment.

The participant believed that analytics could help track student data points, as well as faculty schedules and then correlate both to obtain a clearer understanding of faculty performance. Participant JMLZXbUh stated, "Yes, absolutely I do because I think that in Higher Ed we have a tendency to make decisions based on our gut, and that's just wrong," when asked if analytics would be worth the investment.

> Participant mTXQRnmk also believed in the investment of analytic tools, stating, I do, and that's particularly because it is such an evidence-based culture now…when you want things, you have to show its data. You just can't say, 'Because I feel like it. I just really feel it's important.' You've got to show why.

The participants generally agreed that there was not a funding issue involved with the adoption of analytics. They believed that analytics would certainly be worth the college's investment in both time in training and monetary costs. Cost of analytic tools was not a barrier, and an analytic tool would be worth the investment.

No current use of analytic tools. I developed this theme from the research question: Would college administrators use academic analytics to help increase student success and other managerial tasks? Nine of the 10 participants stated that they did not use analytic tools in the management of their key performance activities. Only participant mTXQRnmk stated,

> Yes. I think we do, on a day-to-day basis, we definitely use the analytic tools. We don't have, probably, access to some of the more robust, but I think through SIS system [this is the college data base system that holds student, course and curriculum information], we can run certain reports ourselves and if we're interested in certain trends, then we're able to get that.

Participants would use academic analytics to help with their daily goals and activities if they had the tools at their disposal. However, no academic manager had access to an analytic tool such as a dashboard, to help with their key performance goals.

Composite Description "Overall General Findings"

The composite description is a synthesis of the descriptions entirety. Creswell (2010) explained this description as the essence of what the participants experienced. The composite description addresses the overall general question, namely: What factors impede the implementation of academic analytic tools in a higher education setting? I used the five emergent themes to develop the findings that addressed this overall question.

The findings that developed from the five themes were that climate, internal policy, training, and possible infrastructure issues of the college hindered the adoption of

academic analytics. Participants generally believed that there was no use of analytic tools because a discrete, centralized department within the college organization kept information separate or controlled. Participant stL64BGZ mentioned that it would be advantageous to have data accessible, “instead of having to use institutional research as the only source of all-data.” This feeling was expressed by participant cudkDAWQ, who stated, “I have to mention that we also have an office of institutional research here at the college, who can provide a lot of analytic information, but it’s a centralized organization, and it’s a very closed part of our organization.” Building on that idea, the participant added, “I also think that, politically, we don’t have access to this information because of that central organization.” Participant JMLZXbUh shared a reason for centralized data by stating,

> Partly because people who run institutional research want to be sure that data are interpreted correctly, and to be sure that they really are cleaned up before people start using them. If you make stuff available in real time, then there are chances for error, and sometimes people don't understand that you're looking at a snapshot. There's a sense that because people are likely to misunderstand data it's better for them not to have them at all, and not every administrator likes numbers.

Participants also noted that there needed to be a more shared environment before adopting an analytic tool to help manage key performances. Participant hdt2odJ5 expressed feelings that the college did not share information between departments and campuses. The participant stated,

> I say to have those tools without alignment is not going to do any good because for example when we do the annual college planning, each campus develops their annual plans. Each campus does it in a vacuum. There is no way to see how the college is performing as a system.

Participant pvofSD7u voiced a similar concern stating, “We need people who agree on the shared vision and the big picture. We're not there.”

The climate of the college emerged as another barrier to the adoption of an analytic tool to assist academic managers at this college. Participant stL64BGZ stated,

> The complexity of what we do is far beyond anything ... [redacted] Community College approaches it, but not in the way we do. The amount of data we have to deal with, the complexity of what we deal with, does not fit or is not needed at [redacted] Community College or [redacted] Community College with four hundred students or whatever. They can get away with a lot of manual stuff.

Participant cudkDAWQ mimicked this idea, asserting,

> I think it’s because we’re a very large bureaucracy, and we move slowly. I think that, despite the fact that these kinds of tools I know are available, could be available, getting around to using them takes a long time for someone to take responsibility and get it in place and, therefore, get it to us.

I interpreted that the climate and internal policy of the college may be barriers in the adoption of analytic tools for academic management use. The interviews revealed that the academic managers of the college did not have access to many institutional data that they felt would be beneficial in their daily activities. The academic managers stated that

they had to ask for data from an internal department, and that if they received the data they asked for, it was usually not in a timely manner. Internal policy and the climate of the college emerged as possible barriers to adoption.

I discovered that participants also thought training could be a barrier to the adoption of analytic tools. Participants did not have time to receive training in another technology or innovation, and that if they were to use analytics in their daily tasks, it would have to be an easy system to learn. I interpreted that the academic managers did not have the time to invest in a new technology that would be cumbersome or complex to learn or to use.

I also interpreted possible infrastructure issues to be a barrier to analytic adoption. Although not entirely within the scope of this study, I was lead to interpret that the many discrete databases used by the varying academic managers, and the different websites used to gather information, may have presented technology problems in adopting a tool that would unite all the systems.

Summary

The purpose of this study was to explore the factors that inhibited higher educational institutions in their adoption of proven analytic tools to help improve management of key performance indicators. This inquiry provided an enriched understanding of barriers to analytic adoption in College Z. I conducted open-ended structured interviews with 10 academic managers in the data collection phase.

The data were audio recorded and transcribed. Each respective participant reviewed their transcription to ensure validity and credibility. The transcriptions were

then, after verification from the respective participants, uploaded to the qualitative data analysis software program MAXADQ for assistance with organization at the granular levels.

I used the method described by Creswell (2012) to analyze the data. The analysis included: (a) listing and preliminary grouping of the data; (b) the reduction and elimination of the data; (c) clustering and thematizing, or listing significant statements; (d) final identification of the invariant constituents, or the themes; (e) writing of individual textural descriptions; (f) construction of individual structural descriptions; and (g) composite synthesis, or overall findings (Creswell, 2012).

I accomplished this phenomenological research study using 10 interview questions, and from the perceptions and experiences of the participants gathered during the data collection phase and the subsequent analysis, from which I identified five major themes. The five themes were (a) an awareness of analytics and analytic tools in higher education, (b) technologies currently used to manage key performance indicators, (c) analytics and analytic tools to help with the management of key performance indicators, (d) investment of analytic tools and, (e) current use of analytic tools.

Through the five major themes, I was able to discover answers to the five guiding research questions. In addition, my review of the composite synthesis provided answers to the general research question: What factors impede the implementation of academic analytic tools in a higher education setting? I discovered that participants at College Z believed that restricted climate, a policy, training, and possible infrastructure issues were all factors that hindered the adoption of academic analytics at their organization.

In Chapter 4, I provided a detailed description of the pilot study conducted, the setting and demographics of the study, the data collection and analysis, and finally, a granular description of the results of the study. Chapter 5 contains a synopsis of the study, interpretation of the findings, limitations of the study, recommendations, and implications of the study. In Chapter 5, I also provided the positive social change and the key essence of the study.

Chapter 5: Conclusions and Recommendations

Introduction

In Chapter 5, I include a summary of the nature of the study and its purpose. This chapter also includes interpretations of the themes from Chapter 4 and how those themes relate to the literature review conducted in Chapter 2. I will discuss the limitations of the study and describe recommendations for further research and the implication for positive social change. The order of Chapter 5 is as follows: summary of key findings, interpretation of the findings, limitations of the study, recommendations, implications, and the conclusion of the study.

Summary of the Findings

In Chapter 1, I introduced the concept of analytics. The use of business intelligence tools, such as analytics, has helped increase the overall growth of business operations including customer retention, return on investments, profit structure, and business total value (Minkara, 2010). These successes are linked to the use of analytics in retail, financial, manufacturing, and telecommunications industries (Seng & Chen, 2010). Researchers have shown that the use of analytic tools in higher education institutions has helped increase student retention, provide transparency of financial reporting, improve management of space, safety and security, and provide visualization of operations in true-time (Baepler & Murdoch, 2010; Bichsel, 2012). However, colleges and universities have not analyzed these data points to help make effective decisions and data-driven forecasts (Baepler & Murdoch, 2010; Dawson et al., 2010).

The purpose of this study was to explore the factors that prevent institutions of higher education from adopting analytic tools that would enable leadership and management to analyze and use data for decisions, planning, and managing operations. I designed this phenomenological study to understand and explore the experiences of individuals managing departments in a community college setting, their experiences in using or not using analytics, and the meaning behind their perceptions of analytic tools. I collected data from interviews of academic personnel and academic managers in a college setting. I analyzed the data using an analytic approach as described by Creswell (2012). I used a qualitative data management software tool to help granularly organize and compile the data.

Five themes emerged from the study, namely (a) an awareness of analytics and analytic tools in higher education, (b) technologies currently used to manage key performance indicators, (c) analytics and analytic tools to help with the management of key performance indicators, (d) investment of analytic tools, and (e) current use of analytic tools. Through the five major themes, I found answers to the five guiding research questions.

An Awareness of Analytics and Analytic Tools in Higher Education

This theme related to the following research question: Are academic administrators aware of how academic analytics could help manage key performance indicators? I found that only two participants were not aware of analytics or what analytic tools could do for higher education organizations. Eight participants stated that they knew of analytic tools and had seen analytic tools in other venues. The participants were all

positive about the idea and concept of analytic tools. The key impressions from this theme led me to the interpretation that the participants, if there was an analytic tool available to them, would use it to help manage their key performance indicators. However, climate and policy factors within the college did not allow academic managers access to robust analytic tools.

Technologies Currently Used to Manage Key Performance Indicators

This theme related to the following research question: What types of discrete databases do academic administrators currently use to help the management of their perspective departments? I found that academic managers used up to five or more databases, information systems, and websites to gather information needed to perform their tasks. The participants mentioned having to collect various data points and then transfer them into an Excel spreadsheet for easier use. This theme led me to interpret that there could be infrastructure issues that presented a barrier to the adoption of analytics.

Analytics and Analytic Tools to Help with the Management of Key Performance Indicators

This theme related to the following research question: How could knowledge management tools, such as analytics, enhance the efficiency of a higher education institution? The participants in the study felt that they could use an analytic tool to “pull two things together” for a better analysis. Another participant saw that analytics could help by sorting, combining, separating, and the research capabilities that a robust analytic tool could provide. Generally, all participants stated that they would use analytic tools if

they were available. The participants mentioned that the college was complex and that information was guarded and slow to its destination point. One participant stated,

> I think it's because we're a very large bureaucracy, and we move slowly. I think that, despite the fact that these kinds of tools I know are available, could be available, getting around to using them takes a long time for someone to take responsibility and get it in place and, therefore, get it to us.

These notions and feelings expressed by the participants led me to interpret that the climate of the college presents a barrier to adoption.

Investment of Analytic Tools

This theme related to the following research question: Does the climate of a secondary education institution hinder the adoption and use of analytic tools or is there an investment/monetary issue? Participants agreed that they would use an analytic tool such as a dashboard, and that the cost of an analytic program or service would be worth the investment. Participant mTXQRnmk discussed whether the value of analytic tools was worth the investment, stating,

> I do, and that's particularly because it is such an evidence-based culture now…when you want things, you have to show its data. You just can't say, 'Because I feel like it. I just really feel it's important.' You've got to show why.

None of the participants believed that the cost of an analytic tool was a barrier for adoption. However, participants did mention that training, the complexity of a new technology tool, and the time it took to learn the new tool would be of concern to their already full daily agendas. Participant rn73xv8V mentioned,

> If it is intuitive, it's wonderful. If the training is not extensive to the point that it takes a half dozen steps to do something I can do somewhere else in two or three, even if I've got to do it several times with several different databases. Time here is more than anything else, the most precious commodity that's here and the one that there's not enough of.

This theme led me to interpret that training in new advanced technologies, such as analytics, may be an adoption barrier.

Current use of Analytic Tools

This theme related to the following research question: Would college administrators use academic analytics to help increase student success and other managerial tasks? Participants said that they would use analytics to help them with their daily tasks, such as tracking student achievement rates and correlating those rates to student participation and engagement, and faculty and curriculum changes. The participants said that they did not have access to any sort of analytics or analytic tool that they could use to manage their key performance indicators, such as student retention. They mentioned that a central department houses data and current information, and that they did not have direct access to the raw data. Participants mentioned, “Politically, we don’t have access to this information because of that central organization.” Another participant identified a possible reason why there was a lack of greater access to the data. Participant JMLZXbUh stated,

> Partly because people who run institutional research want to be sure that data are interpreted correctly, and to be sure that they really are cleaned up before people

> start using them. If you make stuff available in real time, then there are chances for error, and also sometimes people don't understand that you're looking at a snapshot. There's a sense that because people are likely to misunderstand data it's better for them not to have them at all, and not every administrator likes numbers.

These opinions expressed by the participants led me to interpret that an unwritten institutional policy impeded adoption of analytic tools.

I further interpreted the above themes to answer the main research question, "What factors impede the implementation of academic analytic tools in a higher education setting?" I discovered that participants at College Z believed that the climate (organizational bureaucracy), policy (restricted organizational data), training, and the possibility of infrastructural issues were all factors that hindered the adoption of academic analytics at their organization.

Interpretation of the Findings

I based this phenomenological study on Metcalfe's (2010) theory of academic capitalism and the use of information technology to manage key performance indicators in a higher educational setting.

Through the literature review performed in Chapter 2, I showed that there was not widespread use of analytics in higher education institutions, even after studies indicated the positive results of usage (Bichsel, 2012; Dawson et al., 2010). My review also suggested that there were limited studies conducted as to why higher education institutions did not adopt analytics. Bichsel (2012) suggested culture, policy, and infrastructure as possible barriers to adoption of analytic tools in higher education.

Similarly, Lavalle et al. (2011) suggested the biggest impediments for analytics adoption in corporations were to be found in the culture and the climate of a company. The findings of this study confirmed Bischel's suggestion, and extended this belief to include impressions on training for the use of an analytic tool.

Climate

The themes that helped me interpret that the climate of the community college is a barrier to adoption included (a) there is an awareness of analytics and analytic tools in higher education, and (b) The investment of analytic tools. Participants discussed the climate of the organization. Participants generally agreed that the size of the system sometimes caused delays and administrative inflexibility regarding information sharing. Another participant shared that the college was lacking alignment and repeatable processes common throughout all the campuses of College Z. Bischel would agree that bureaucracy and the culture of a college could prevent the necessary shared vision for the adoption of an analytic tool (Bischel, 2012).

Policy

The themes that helped me interpret that the policy of the community college was a barrier to adoption included (a) technologies currently used to manage key performance indicators, and (b) there is an awareness of analytics and analytic tools in higher education. The participants discussed policy when they mentioned access to data and the current technologies they use. Participants shared that they did not have direct access to institutional data, and that when they did receive reports generated for them, these reports were outdated and static. The participants agreed that the old reports were extremely

useful for histories, but that they did not receive the data on a needs basis or in a timely manner. Participant JMLZXbUh perhaps shed light on the closed access to institutional data that the participants felt they had little access to. The participant stated that institutions kept data for long periods and in a closed access manner so that the institution could scrub data for inaccuracies and then redistribute data appropriately. This policy mirrored Bischel's (2012) impression that college policies could be a barrier to analytic adoption.

Infrastructure

The theme that helped me interpret that the infrastructure of the community college is a barrier to adoption was the technologies currently used to manage key performance indicators. The participants often mentioned the different siloed sources of information they used to manage their daily tasks. Most participants discussed how they accessed the college website and at least two different databases to collect data. They, at some point, transferred this data to a spreadsheet and then used meetings or e-mail to disseminate the collected information. Participant rn73xv8V mentioned using six different databases, including budgetary and student databases. This participant mentioned receiving training on conversion software to convert information in websites and databases into a spreadsheet format for easier dissemination and sorting capabilities. Bischel (2012) suggested the infrastructure of a college could be a barrier to analytic adoption. It was outside of the scope of this study to investigate the supporting infrastructure of the flow and processing of data within the organization; however, the

processes in which academic managers acquire and use data at this college were disconnected and time consuming.

Training

The theme that helped me interpret that the infrastructure of the community college is a barrier to adoption was how analytics and analytic tools can help with the management of key performance indicators. One concept Bischel's (2012) study did not explore was training issues in the use of analytic tools. The participants in the current study felt that the use of analytic tools would be useful and helpful in the management of their key performance indicators. However, the participants stated that training could be an issue if an analytic tool was too complicated or took too much time to learn. Participant cudkDAWQ suggested that improvement was needed, but that if the tool took too long to learn, was difficult, or the training was deficient, that most academic managers would not use it.

Limitations of the Study

There were several limitations to this study. I used a small sample and single setting for this study. I only interviewed academic managers who had key performance indicators to include student retention, faculty training and observation, the management full time equivalent of budgetary operations, curriculum reviews, and policy compliance. I did this to gather the perceptions of persons whose daily tasks involved the usage of student data, curriculum, and budgetary data. There were other managers involved with the operations of College Z who were not included in this study such as police officers,

facilities management, budgetary control, and financial aid representatives, as they fell outside the scope of this study.

I did not interview the department that housed and controlled a significant portion of the data and the reports that the participants in the study mentioned. In this study, I focused on managers who used the data in the management of their tasks and performance, not managers who gathered, cleaned, and packaged the data to give to the front line academic managers. However, this could affect the results due to the importance of the data controlled by the research department.

Due to the need for a criterion sample and the time available with academic administrators, I used interviews as the primary method of gathering information. To control for these limitations, I conducted member checks of transcriptions and a peer review of results.

Another limitation was the role of the researcher. I was the sole data collector, analyzer, and interpreter of the interview materials. Because of this, I needed to be aware of biases, beliefs, and preconceptions. Due to this heightened awareness, I believe that I did not affect the results of this phenomenological study.

Recommendations

Based on the literature review found in Chapter 2, the use of analytics to help drive decisions and meet key performance indicators in higher education institutions has been proven to be effective (Barneveld, 2012). However, colleges and universities continue to be slow to adopt academic analytics (Dawson, 2010). The purpose of this

study was to gain an understanding of the factors that impeded the implementation and use of an academic analytic tool in a community college.

I discovered that participants at College Z believed that the organizational bureaucracy (climate), restricted organizational data (policy), training, and the possibility of infrastructural issues were all factors that hindered the adoption of academic analytics at their organization. These barriers mirrored Bischel's (2012) study that suggested culture, infrastructure, and policy may be barriers to adoption of an analytic tool in a higher education organization.

Goldstein (2005) reported that educational institutions that adopted academic analytics to improve institutional decision-making improved in the functional areas of student retention and financial results. College Z had no analytic tools to aid academic managers in their key performance indicators. College Z should consider addressing the practice of departmental IT-generated reports that they then disseminate to the academic managers (Ravishanker, 2011).

Participants of this study mentioned that they sometimes relied on reports generated for them. Participant cudkDAWQ stated that in one instance, the participant requested a certain report; however, the participant received no response or the data requested. Participant stL64BGZ mentioned that all data derived from another source (separate department), and that it was sometimes difficult to acquire reports and data in a timely manner. This is a concern and the college leadership should address this perception.

Future Research

The first research question that was asked was the following: Are academic administrators aware of how academic analytics could help manage key performance indicators? The participants stated they knew of analytic tools, and had seen analytic tools in other venues such as companies like Amazon and Netflix. Participants stated that they would use some sort of analytic tool, such as a dashboard, to help them with their key tasks. Future research could explore how effective the use of a dashboard is in helping to correlate student failure rates and faculty training.

The second research question that was asked was the following: What types of discrete databases do academic administrators currently use to help the management of their perspective departments? The participants all stated that they used the college student database, departmental-created discrete databases, and the college website. They stated that in most cases, they e-mailed Excel spreadsheets and Word documents throughout their department for communication and to conduct procedural work. A future study could determine the efficiency of using an analytic tool to manage work, as opposed to the use of discrete databases and e-mailing spreadsheets for collecting and storage of important data points.

The third research question that was asked was the following: How could knowledge management tools, such as analytics, enhance the efficiency of a higher education institution? Participants stated that they would use analytics to help with student retention. Participants agreed that timely information was needed, especially during critical periods such as student registration. They believed they would be more

effective managers if they had a program that could manage current data in a way that was user friendly and required little training. Future researchers could conduct an efficiency study to study whether academic managers are more efficient at achieving their key performance indicators when they have analytic tools.

The fourth research question that was asked was the following: Does the climate of a secondary education institution hinder the adoption and use of analytic tools or is there an investment/monetary issue? The participants did not believe that there was a monetary issue in the way of adoption, but they mentioned college policies, bureaucracy, and infrastructure as possible barriers. A future study could explore barriers at a four-year university and determine whether the themes are similar to the themes at a two-year community college.

The fifth research question that was asked was the following: Would college administrators use academic analytics to help increase student success and other managerial tasks? All participants agreed that they would use academic analytics to help increase student success. The participants felt that they, with the use of a tool such as a visualization dashboard, would be able to better complete their goals. They agreed that the college database is a helpful tool, but to have on-time current information, pulled from the various pushed to them in a visual format, would be valuable. Further research could explore IT adoptions, and whether managers used the new tools available to them when adopting an analytic tool.

Additionally, a future study could include managers in other capacities of the college. Future researchers could study the separate department that controlled

institutional data, and explore the policies and procedures regarding data accessibility for the college. Future researchers could also compare colleges of different sizes, colleges that are private and colleges that are profit based, and rural versus urban colleges. A study could explore how these diverse colleges use analytics and how their unique situation affects the use of their data. I identified a need for a future study of how students use analytics to control and shape their college experience.

Implications

Researchers have shown that colleges and universities are collecting significant amounts of institutional data in the areas of enrollment, finance and budget, student progress, research, and learning management. These data are piecemeal and not widely or easily available to all departments and administrators. Rather than having the data pushed to them, administrators must decide what data points are most salient, know where to access that data, pull it, potentially from multiple sources, and then analyze it. There is a need for colleges and universities to integrate data into one accessible package where researchers can analyzed and use the data to make proactive decisions with significant impact (Bichsel, 2012). Researchers can customize a single digital interface to provide as much or as little data as the user needs to more effectively manage departmental tasks and outcomes, to supply this information on a real-time basis. Academic analytics transforms colleges and universities in terms of increased student retention and graduation rates, improved student access, more effective utilization of human and capital resources, and provide answers and decision support based on data-driven evidence (Bichsel, 2012).

College Z's mission for social change drove the need for such analytics, as the college strives to significantly increase the graduation rates of the students. By utilizing analytical tools and real-time data pulled from multiple sources, academic managers at the college may be able to more effectively analyze student data in a timely manner, which will allow them to proactively assist students who are in academic distress or students who are in danger or dropping out of school.

When colleges and universities use existing data to manage key performance indicators more effectively, they save money, decrease time from enrollment to graduation, and have more transparent ways to track successes and improve forecasts (Dziuban et al., 2012; Smith et al., 2011).

I designed this phenomenological study to explore why College Z has not yet adopted an academic analytic platform to manage key performance indicators to reach and exceed its mission. From analysis of interviews, the major themes of (a) an awareness of analytics and analytic tools in higher education, (b) technologies currently used to manage key performance indicators, (c) analytics and analytic tools to help with the management of key performance indicators, (d) investment of analytic tools and, (e) current use of analytic tools were discovered. Further analysis resulted in the interpretation that participants at College Z believed that the organizational climate, policy, training, and the possibility of infrastructural issues were all factors that hindered the adoption of academic analytics at their organization. The implications of the findings of this study indicate that for College Z to realize its goal to positively affect the students and potential employers in the region, it will need to be more efficient, provide a higher

quality of services, and be able to measure outcomes. The participants in this study believed that the successful obtainment of College Z's mission to increase retention rates of students, to increase graduation and transfer rates, to increase career placement rates, and to increase enrollment rates of underrepresented populations is achievable through easier access and better use of their existing data.

Positive Social Change

Figure 3 illustrates the potential impact for positive social change at the societal level, the organizational level, and individual level if College Z were to adopt analytic tools. Researchers have proven that analytic tools help colleges sort interest level data of perspective students, target under-served populations, and help with materials collection for enrollment purposes. Analytic tools can better empower career and academic advisors as they search for student employment opportunities, and help merge curriculum to industry needs.

Organizationally, the adoption of analytic tools allows academic managers to track student success and student needs in a timely manner. Academic counselors, faculty members, and academic managers may instantly see when a student experiences a gap in success, attendance, resource management, or other retention factors. Analytics can help College Z capitalize on community partnerships and alumni contributions, making a positive impact in serving the community and alumni using better data to strategize where there is greater need for workforce development activities.

Individual students at the college would perhaps be the most impacted by analytic tools. Students could analyze their own progress, and they could benchmark their

progress against other students' progress and course goals and behaviors. Students could use analytics tools to better plan their educational experience, search transfer locations, seek financial aid prospects, and plan, research, and discover future employment opportunities, including areas of which they would not otherwise be aware. Analytics could be a liaison for current students and alumni to share like goals, employment possibilities, and mutual interests. Analytics could provide a richer college experience that keeps students engaged through their entire school life. Figure 3 demonstrates how each sector could benefit from the use of academic analytics.

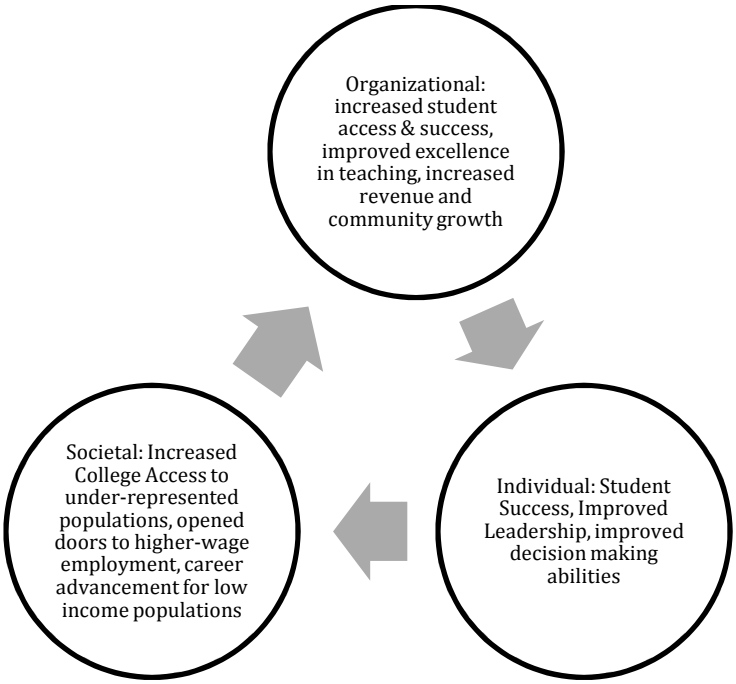

Figure 3. The organizational, individual, and societal impact of the use of academic analytics in higher education.

Methodological Implications

I could have explored a different method of analysis for this research. In this study, I used Creswell (2012) as a structure for the analysis of the data. The strengths of using this framework included reaching an in-depth interpretation of the participants' experiences. There are other frameworks for qualitative studies, and additional research using a different framework may add to the richness of the data interpretation. In addition, the availability of a larger subject pool would allow for the further testing and refinement of the survey tool. This could lead to quantitative studies to establish which factor(s) had the most impact as a barrier or barriers to implementation of academic analytics. By conducting additional quantitative studies, future researchers could explore a comparison of colleges and the use, nonuse, and barriers to adoption.

Academic Practice

A recommendation stemming from this study is that College Z could work to build a more collaborative functioning environment between the separate data-driven department and the college's academic managers. College Z should evaluate how the climate and data policy affects the management of the college as a whole. College Z should also act to leverage the immense functional knowledge base of its software developers, IT engineers, and data analysts by aligning them in teams to collaborate more closely with the functional managers who need timely and dynamic data to perform their key duties.

An additional recommendation stems from the possible infrastructure issues the college may have. Participants of this study additionally mentioned the different

databases and websites they had to access to collect needed data. Participant rn73xv8V said that much data used are not in a transferrable format. Participants also revealed that collected data are and kept in different, non-centralized repositories. College Z needs to evaluate local databases, sometimes labeled “shadow” systems (Ravishanker, 2011), as well as separate discrete databases. Establishing one central repository that would bring all sources together and that was easily accessible could have a tremendous institutional impact. This central repository would help define institutional data across departments and campuses and could afford academic managers innovative and fresh perspectives.

Participants identified training as a possible barrier to adoption. College Z needs to assess the skills gap of trained academic administrators with experience in analytics. Professional development in analytics, with an emphasis in the functional ranks especially, and at all levels generally, would increase the awareness of analytics and the use of analytics when and where available.

In closing, I considered Vidal’s (2014) discourse on a worldview and, specifically, to where we are progressing as a society and as an intelligent life. In this study, I provided an insight as to why academic managers at College Z did not use proven analytic tools to help its student population prepare for and gain access to a better life. Vidal noted that, based on values and provided with new information and new answers, individuals have choices to make to move forward. The mission and the goals of College Z prove that the college values its students. The next step for the college is to be willing to work to diminish the barriers that hold them back from providing managers with powerful analytic tools to ensure student success.

Conclusion

The results of this study support claims of prior researchers that cost was not a significant barrier, but that factors internal to the organization acted as barriers to adoption. The analysis of the data determined five themes that suggested academic managers were aware of academic analytic tools, but these tools were not in wide use. Further analysis of these themes revealed that policy, climate, infrastructure, and training were barriers to the adoption and widespread usage of analytics at the college.

Researchers have shown that the use of academic analytics improved student retention through early warning systems, alerts, and student engagement tracking. The use of analytics could help students select the correct courses and levels based on their past performance and prior courses taken. Academic managers could also use analytics in academics to develop schedules, track teacher performance, and credentials, develop strategies to increase grant and alumni funds, and increase student financial aid opportunities.

As colleges and universities move to a more student centered learning environment, the most important use of academic analytics may be in the hands of students. Students will be able to plan their academic experience and track their progress in each course, and be able to compare their efforts and results to those of their peers. This powerful tool could aid students' engagement in coursework and with their engagement at the college. Students will also be able to uncover potential career and employment prospects and design future educational and life goals. When students have

access to their own data and are able to relate to it in an applicable manner, they can shape a more meaningful and real future for themselves.

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Appendix A: Redacted List of Possible Participants at College Z

[redacted]	[redacted]	Acting Provost
[redacted]	[redacted]	Academic Dean
[redacted]	[redacted]	Acting Dean
[redacted]	[redacted]	Provost
[redacted]	[redacted]	Academic Dean
[redacted]	[redacted]	Academic Dean
[redacted]	[redacted]	Academic Dean
[redacted]	[redacted]	Academic Dean
[redacted]	[redacted]	Provost
[redacted]	[redacted]	Academic Dean
[redacted]	[redacted]	Acting Dean
[redacted]	[redacted]	Provost
[redacted]	[redacted]	Associate Dean
[redacted]	[redacted]	Associate Dean
[redacted]	[redacted]	Provost
[redacted]	[redacted]	Academic Dean

[redacted]	[redacted]	
[redacted]	[redacted]	Acting Dean
[redacted]	[redacted]	Provost
[redacted]	[redacted]	Academic Dean
[redacted]	[redacted]	Academic Dean
[redacted]	[redacted]	Acting Dean
[redacted]	[redacted]	Executive Vice President
[redacted]	[redacted]	Associate Vice President
[redacted]	[redacted]	Coordinator of Transfer Services
[redacted]	[redacted]	Associate Vice President

Appendix B: Sample Letter to Invite Participants to the Study

(This form represents the letter for an invitation to participate in research that will be sent out to each potential research participant).

January 15, 2014

Dear Potential Research Participant:

This letter is to solicit your participation in a research study. I am a Doctor of Philosophy degree candidate at Walden University in Management. This study is part of the research requirement for the completion of the degree program.

I plan to conduct a study on the following topic: Academic Analytics in Higher Education: Barriers to Adoption. I intend to explore the extent to which Higher Education academic managers use academic analytics to manage their key productivity indicators.

Each potential participant was identified due to his/her academic management position within the College. If you consent to participate in the study, we would engage in one (1) interview session lasting from 35-45 minutes in length and at a place that is convenient for you. After the interview, which will be audio recorded, I will transcribe the interview. I will then send you via e-mail the transcription. At this time, you may contact me to revise any information and review any follow-up questions that may arise.

You will be given the interview questions (10 total) in advance. This is done so that you will know exactly what questions will be asked, and that you may consider your responses in advance. You will be permitted to refuse to answer any question during the interview process.

Your name and all identifying indicators will be kept confidentially with me and locked in my home office for the duration of five years following the publishing of the study. At that time, all materials will be appropriately destroyed.

If you are willing to participate in an interview within the next few months, please contact me as soon as possible. My contact information is noted below. Your consideration to participate in this study is greatly appreciated. I look forward to hearing from you soon.

Sincerely,

Willie Pomeroy
Walden University, College of Management

E-mail: willie.pomeroy@WaldenU.edu
Daytime Phone: (703)343-5211
Mailing Address:
115 Caragana Ct.
Sterling, VA 20164

Appendix C: Sample of Letter Sent When Study Capacity was Obtained

(This form represents the letter sent to possible participates that did not respond, letting them know that the research capacity was obtained and thanking them for considering possibly participating)

January 30, 2014

Dear Possible Participant,

I am writing to thank you for possibly being willing to participate in my study. Luckily I have reached my saturation point with participants and no longer need further participants. I would like to keep your e-mail however in the event a participant decides not to join the study.

Thank you,

Willie Pomeroy

Appendix D: Setting Appointments for Interview

(This letter represents the e-mail sent to participants asking to set up a time and place for the interview).

February 1st, 2014

Dear Participant,

Thank you for agreeing to participate in my study. Is it possible that we set up a time and a place to have a confidential 30-40 minute discussion? I will send you the questions I will ask, along with a consent form. Please do not sign the consent form now, I will bring a copy for you, and a copy for me, at the time of the interview. We can sign the copies at that time.

Please e-mail me your preference for an interview within the next two week.

Thank you,
Willie Pomeroy
Willie.pomeroy@waldenu.edu

Appendix E: Permission to Reprint/Cite Ali & Magalhaes Interview Protocol

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Appendix F: Permission to reprint and Adapt Interview Protocol by Venkatesh

(This is the e-mail communication between myself and Dr. Venkatesh)

Subject : **RE: Permission to reprint and adapt TAM3 Model for Dissertation Study**
Date : Tue, Sep 10, 2013 12:24 PM CDT
From : [redacted]
To : [redacted]

Thanks for your interest.

You have my permission.

You will find other related papers at:
http://vvenkatesh.com/Downloads/Papers/fulltext/downloadpapers.htm

You may also find my book (that can be purchased for a significant student discount and faculty member discount) to be of use: http://vvenkatesh.com/book

Hope this helps,

Sincerely,

Viswanath Venkatesh

Distinguished Professor and George and Boyce Billingsley Chair in Information Systems

Walton College of Business

University of Arkansas

Fayetteville, AR 72701

Phone: 479-575-3869; Fax: 479-575-3689

E-mail: [redacted]

Website: http://vvenkatesh.com

IS Research Rankings Website: http://vvenkatesh.com/ISRanking

From: Willie Pomeroy [redacted]
Sent: Thursday, August 22, 2013 12:43 PM
To: [redacted]
Subject: Permission to reprint and adapt TAM3 Model for Dissertation Study

August 22, 2013

Viswanath Venkatesh
Department of Information Systems
Walton College of Business
University of Arkansas
Fayetteville, AR 72702
e-mail: [redacted]

Dear Dr. Venkatesh:

I am currently pursuing a PhD in Management (Decision Sciences) at Walden University in the United States. I am in the process of preparing my dissertation and am seeking permission to include and adapt the following material in my study:

Source Journal: Decision Sciences Institute
Journal Title: Decision Sciences
Article Title: Technology Acceptance Model 3 and a Research Agenda on Interventions
Authors: Venkatesh, Viswanath & Bala, Hillol
ISSN: 00117315
Date: 2008

Intended Use: To conduct interviews using TAM3 model
Intended Use Other: Reprint and Adapt for my academic paper- Doctoral dissertation

Description: I am exploring barriers to the adoption of analytic tools in a higher education setting. I read your study Technology Acceptance Model 3, and I find your model for IT adoption especially useful in eliciting in-depth information regarding barriers to IT adoptions. I would like to use your instrument tool/model to conduct research at Walden University, College of Management and Technology, and incorporate it into my dissertation. The model and questions will be adapted and modified such that they could answer my research questions regarding barriers to the adoption of academic analytics. This adaption is only minor and does not alter the previous model beyond its intended use.

I would be happy to provide you with the finished study.

Please let me know if there is a fee for using your work in this manner. If there is no fee, a return e-mail granting permission is all that is needed. Thank you for your consideration.

Willie Pomeroy

Appendix G: Pilot Study Participant Invitation

(This represents the e-mail sent to Participant A for Pilot Study)

February 26, 2014

Dear Potential Research Participant:

This letter is to solicit your participation in a pilot research study. I am a Doctor of Philosophy degree candidate at Walden University in Management. This study is part of the research requirement for the completion of the degree program.

I plan to conduct a study on the following topic: Academic Analytics in Higher Education: Barriers to Adoption. I intend to explore the extent to which Higher Education academic managers use academic analytics to manage their key productivity indicators.

You were identified and selected to participate in the Pilot Study through your college's website and its identification as you being an academic manager for the college. If you consent to participate in the study, we would engage in one (1) interview session lasting from 35-45 minutes in length and at a place that is convenient for you. After the interview, which will be audio recorded, I will transcribe the interview. I will then send you via e-mail the transcription. At this time, you may contact me to revise any information and review any follow-up questions that may arise.

You will be given the interview questions (10 total) in advance. This is done so that you will know exactly what questions will be asked, and that you may consider your responses in advance. You will be permitted to refuse to answer any question during the interview process.

Your name and all identifying indicators will be kept confidentially with me and locked in my home office for the duration of five years following the publishing of the study. At that time, all materials will be appropriately destroyed.

If you are willing to participate in an interview within the next few months, please contact me as soon as possible. If you would like to participate, at the time of our interview, I will ask you if you know of other academic managers who may be willing to participate in the study. My contact information is noted below. Your consideration to participate in this study is greatly appreciated. I look forward to hearing from you soon.

Sincerely,

Willie Pomeroy
Walden University, College of Management

E-mail: [redacted]
Daytime Phone: [redacted]
Mailing Address: [redacted]

Appendix H: Walden University IRB Approval

Forwarded message ----------
From: IRB <IRB@waldenu.edu>
To: "willie.pomeroy@waldenu.edu" <[redacted]
Cc: "Pascale Hardy ([redacted])" <pascale.hardy@waldenu.edu>,
Walden University Research <research@waldenu.edu>
Date: Wed, 5 Feb 2014 14:45:02 -0500 (EST)
Subject: Notification of Approval to Conduct Research-Willie Pomeroy

Dear Ms. Pomeroy,

This e-mail confirms receipt of the letter of cooperation for the community research partner and also serves as your notification that Walden University has approved BOTH your dissertation proposal and your application to the Institutional Review Board. As such, you are approved by Walden University to conduct research.

Please contact the Office of Student Research Administration at research@waldenu.edu if you have any questions.

Congratulations!

Jenny Sherer

Associate Director, Office of Research Ethics and Compliance

Leilani Endicott

IRB Chair, Walden University

Forwarded message ----------
From: IRB <IRB@waldenu.edu>
To: "[redacted]
Cc: "Pascale Hardy [redacted]
Walden University Research <research@waldenu.edu>
Date: Tue, 28 Jan 2014 09:22:36 -0500 (EST)
Subject: Conditional IRB Approval-Willie Pomeroy

Dear Ms. Pomeroy,

This e-mail is to notify you that the Institutional Review Board (IRB) has approved your application for the study entitled, "Academic Analytics in Higher Education: Barriers to Adoption" conditional upon the approval of the community research partner, as documented in a signed letter of cooperation. Walden's IRB approval only goes into effect once the Walden IRB confirms receipt of that letter of cooperation.

Your approval # is 01-28-14-0231112. You will need to reference this number in your dissertation and in any future funding or publication submissions. Also attached to this e-mail are the IRB approved consent forms. Please note, if these are already in an on-line format, you will need to update those consent documents to include the IRB approval number and expiration date.

Your IRB approval expires on January 27, 2015. One month before this expiration date, you will be sent a Continuing Review Form, which must be submitted if you wish to collect data beyond the approval expiration date.

Please note that this letter indicates that the IRB has approved your research. You may NOT begin the research phase of your doctoral study, however, until you have received the **Notification of Approval to Conduct Research** e-mail. Once you have received this notification by e-mail, you may begin your data collection. Your IRB approval is contingent upon your adherence to the exact procedures described in the final version of the IRB application materials that have been submitted as of this date. This includes maintaining your current status with the university. Your IRB approval is only valid while you are an

actively enrolled student at Walden University. If you need to take a leave of absence or are otherwise unable to remain actively enrolled, your IRB approval is suspended. Absolutely NO participant recruitment or data collection may occur while a student is not actively enrolled.

Your IRB approval is contingent upon your adherence to the exact procedures described in the final version of the IRB application materials that have been submitted as of this date. If you need to make any changes to your research staff or procedures, you must obtain IRB approval by submitting the IRB Request for Change in Procedures Form. You will receive confirmation with a status update of the request within 1 week of submitting the change request form and are not permitted to implement changes prior to receiving approval. Please note that Walden University does not accept responsibility or liability for research activities conducted without the IRB's approval, and the University will not accept or grant credit for student work that fails to comply with the policies and procedures related to ethical standards in research.

When you submitted your IRB application, you a made commitment to communicate both discrete adverse events and general problems to the IRB within 1 week of their occurrence/realization. Failure to do so may result in invalidation of data, loss of academic credit, and/or loss of legal protections otherwise available to the researcher.

Both the Adverse Event Reporting form and Request for Change in Procedures form can be obtained at the IRB section of the Walden web site or by e-mailing irb@waldenu.edu:
http://inside.waldenu.edu/c/Student_Faculty/StudentFaculty_4274.htm

Researchers are expected to keep detailed records of their research activities (i.e., participant log sheets, completed consent forms, etc.) for the same period of time they retain the original data. If, in the future, you require copies of the originally submitted IRB materials, you may request them from Institutional Review Board.

Both students and faculty are invited to provide feedback on this IRB experience at the link below:

http://www.surveymonkey.com/s.aspx?sm=qHBJzkJMUx43pZegKlmdiQ_3d_3d

Sincerely,

Jenny Sherer, M.Ed., CIP

Associate Director

Office of Research Ethics and Compliance

irb@waldenu.edu

[redacted]

[redacted]

Office address for Walden University:

100 Washington Avenue South

Suite 900

Minneapolis, MN 55401

Appendix I: Redacted Participate Transcript

(A sample of a participant transcript)

Researcher: Thank you very much, [redacted] for agreeing to be part of this study. I appreciate your time. Now we'll start with question. The first question is what is your position within [redacted] and how long have you worked for [redacted]?

Speaker 2: My position is [redacted] and I have worked for [redacted] for 31 years.

Researcher: You have quite a few years of experience.

Speaker 2: I do, I started here as an instructor for [redacted], then I became the program head for Horticulture, then I became the college's first [redacted] which is my first college-wide position. Then I went back to my home campus for a year to serve as a Division Chair, which is what you would now called a Division Dean. That person went on sabbatical, and then I came back as an [redacted] for another couple of years.

Then I moved into this position 16 years ago.

Researcher: Can you describe to me your top three to five primary key performance indicators or goals for example what top important things are you task to follow?

Speaker 2: One of the big things would be program viability. For example every three years I have to respond to the [redacted], about programs that don't meet their viability standards. It's helpful to me to be able to keep track of them from day to day, or really from say month to month at the most. Are there students placed in the programs, how many students are graduating, and what are the enrollments in the key classes within those programs.

Because that helps me to see trends, and therefore to deal with issues before they become serious problems. Looking at enrollment data is one thing, it needs to be specific. I get the data both from our Institutional Research Office, and from the [redacted] on a daily basis, that tells us how many students in total are

enrolled, and how many FTE's there for the college overall and for the system overall.

What I need in order to actually do anything, is to see how many students are in a particular program or in a particular discipline. That's number one, looking at the program and disciplines. Another key thing that I have to deal with is looking at, what's happening externally, where are the jobs? Specifically where are the jobs and in what are they for which an associate degree can prepare students

Because I need to be able to see if our curriculum as a whole really is serving our region producing students who or what the employers really need. Of course transfer is about two thirds of our students, you still have to think about these things because I need to know of those positions out there, which ones really need a bachelor degree or higher. That if somebody where to come to me and say I want to develop an Associate of Applied Science in this, which is just intended to be a terminal degree.

Then I could look at this dashboard, "Nope, nope, nope they need at least a Bachelor's Degree on that" We need to develop either a transfer program, or we need to develop an AAS, but that is setup so it can transfer with articulation agreements or something like that. Environmental scanning data would be extremely helpful to me.

Researcher: Okay, well can you take one of those KPI's and describe how you manage it?

Speaker 2: Well, if we look at the enrollment data for [redacted] I go through our fact book, as soon as the new one comes out. I look at the trends, first I looked at the program placement for every single program. As you may know, if you seen our fact book it was the number of students enrolled in a program over in the last five years. Of course one of the problem is, this is two years old already by the time the fact book comes out ...

Researcher: The fact book it's put together by Office of Institutional Research?

Speaker 2: That's correct, yes. It's a wonderful, wonderful resource but because they make sure the data are absolutely clean, it comes out, and it's already sort of outdated. Still good for trends, I look at the

number of students who were place in a program. What it doesn't have though is the number of students placed in certificates or specializations. When you have a program like business management that has numerous specializations.

The figures are in the fact book, only they lump them all together. You don't know maybe all the students are majoring in business management the parent program itself, and there's nobody in specializations we have no way of knowing that. That would be extremely helpful to me. Then it would also be helpful though, not just to me personally, but one of the things that I do, is I reach out to the Academic Dean and say “hey I notice that this program is trending down hill either in program placement or in numbers of graduates or both.”

It would be helpful to me to be able to say, "Really I see that overall the parent is doing okay, but the specializations are going down hill." Maybe what we need to do is eliminate the specializations and bulk up the parent, it would help me to give better advise to the campus, deans, and provost.

Researcher: You mention this fact book as data you reference. Are there other resources that you go to?

Speaker 2: Well, I do look at [redacted] data, and then I also look at [redacted] data, [redacted] data. Particularly when I'm trying to think about transfer issues, that would actually be my third category of performance indicators. Because one of the things that I'm suppose to do is to facilitate transfer. As you may know that involves two things, one is making sure we have the right transfer program with the right courses, but also supervising the coordinator for transfer services.

Working on articulation agreements and things like that, it would be really helpful to have data on where students in various programs are going, to know how many are applying to the various schools, and then compare that with how many were actually accepted, and how successful are they once they're there. We used to get data like this, from [redacted]. For awhile there was a law, they have to submit data.

That's gone now, we don't get it anymore.

Researcher: You don't know where your graduates go after leaving [redacted]? Who's continuing on, or what they do after they graduate?

Speaker 2: Our Institutional Research Office does do an annual graduate survey. It's got a very little response rate. It's not because they don't try, they do try. It's because they compare data, from year, to year, to year, to year, so they never change the questions. Some of the questions are pretty outdated and they don't really help you get out what you need to know.

We do have the graduate survey. You asked did that meet your goal? If they set their goals, transfer and 95% of students say yes, it did help me meet that. Then if you go on and say "so did you have any problems," and then they say "yes well my courses didn't transfer well."

That's where we needed to be able to break it down and say all right "were these students in English and then they decided to go major in French," and so of course they didn't transfer well. Is it that our courses don't align well with the particular university, or was it something else?

But that's not recorded, and of course from my assessment days. I like, there are more authentic assessments, and I like data, or data that show me the students who started here [redacted], let's say in Business Administration. I would like to know, for those who transfer to [redacted], and to the school of management, which is their business program. How did they fair? What was their GPA after the first year, what was their GPA upon graduation, and did they graduate with their Bachelors Degree?

Speaker 2: Then I would like to know the same thing for the students who majored in business management here and transferred. The last time I had data like that, probably maybe 18 years ago, the state had a grant and we did that and we could see that actually the business management students did better than the business administration.

Researcher: Now you have no way ...

Speaker 2: No we don't know ...

Researcher: Because they'll separate. Well can you think of how you use analytic tool in the management of your daily activities?

Speaker 2: Not sure I do. I do use like I say ... I have a website actually, sometimes when I'm trying to look up something in particular maybe for grant proposal. Maybe when somebody has done a program proposal to me, and I want to see if it make sense because it's related to something else, then I go to the OIR website I see whatever I can find on enrollment in related disciplines ...

Researcher: So you search around and try to figure it out?

Speaker 2: Yes.

Researcher: Okay, describe your experience using technology to reach your goals. I know that you mentioned this website, you use. Are there different databases that you access, anything like that?

Speaker 2: Only on the [redacted] website. Other than that, really I'm looking at stuff on a very mega basis, the OIR stuff that's very broad. It would be helpful to use those technologies to really make it so that it was very specific to a program, and a program, within a program like a specialization. Not just lumping everything together. It would also be good to actually use it to analyze. To pull two things together, let's say I could say "Gosh is it really because the adult students do better than young students?" Or something like that.

It would be good to be able to say within business management, do the adult students do better than the young ones, if so is there anything they can do about it? Maybe that's just one of those things. As long as you got a bunch of young students you're going to have problems because they're not mature. We did in fact, use ... We found years ago, age and grade and English were two best predictors of success upon transfer.

Researcher: How did you find that?

Speaker 2: Because of the transfer data we got from the senior institutions.

Researcher: Other institutions giving you data, in order to help?

Speaker 2: Yes, one of the areas in which we really need to have various specific data are in looking at the effectiveness, of developmental

studies and English as a second language. There are couple of things you need to be able to look at there. First of all you need to see how long the students are stuck in developmental or ESL. You also need to be able to see if they take certain developmental course, and then they move into either another developmental course, or a to a college credit course, how do they do in the subsequent course?

Were they prepared, or were they not prepared? Then you need to follow them, and say okay for example in English. Developmental English is basically preparing students for Freshman Composition. Is that also preparing them for success in all of their other courses? Because contrary to popular belief, a lot about our faculty do in fact require reading and writing.

It's not enough for a student to be okay, in Freshman Composition. They may need to be able to read and write in other courses as well. Looking at their overall GPA, is there a different between students who started developmental English or math and those that go on -those who didn't need it in the first place. If so what do you do about it, but that's, that's when you use your own brain not ... No data is going to tell me what to do about it.

Researcher: You're saying the kind of IT applications you think would help you would be a system that could perhaps gather all of this data together in one spot, where you could manipulate it and compare it and actually be able to drill down deeper without having to go to another database or another higher institution but it would have to be localized.

Speaker 2: Yes, one of the things that is really ultra important to me is when these databases are available is to have very clear definitions. Because for example I've been on this task force for the [redacted] developing their dashboard. One of the things we have to talk about was what does this term mean to [redacted]

Speaker 2: You have to know what the data really means, and this is something that when the [redacted] for example puts out data and then the college president says "Hey how can that be?" That's because they mean something different. For example program placements or FTE's -okay there are program place FTE's and then there are

discipline FTE. When I have to respond for example as I now do to the [redacted] viability study, and it says this program has low FTE's. It's not talking about FTE within the core discipline in say Accounting or Hospitality.

It's talking about the FTE's taken by students placed in the program, no matter what courses they were taking, you know English, history, math whatever else. You need to understand what the people mean when they say FTE's. Dual enrollment, big, big, big problems partly because they're not always coded correctly, garbage in, garbage out that's one issue that you got we've got to deal with.

In addition when you say dual enrollment do you really mean just students who are in contract courses at the high school or do you mean students who come to [redacted] classes and they just fit in and you don't even realize they're also in high school. Do you specifically mean students who are getting dual credit both toward their high school diploma and their college education or do you specifically mean those students who are taking a course that applies to both high school diploma and their college education.

Speaker 2: The data definitions need to be very, very clear.

Researcher: All right, can you describe any training you have received in the usage of analytic tools in your work place?

Speaker 2: Well, I guess when ... I've been on [redacted] committee they have trained us about how to use the new system. That was useful, except I couldn't go to the main training where it would have been face to face, and they could have really taught me.

Researcher: It was a Webinar?

Speaker 2: Yeah, webinar and then I have to just sit down and do it, and play with it and of course that means setting aside time to do that, so I haven't done a good job of that. It really would have been much more time efficient if they had said okay you will be here at this time, and you will set aside a day to come and learn how to do it and then do it several times so that you remember.

Researcher: One thing that I hear that you're saying also, is learning a new system is time consuming and sometimes not exactly worth it if you're not trained properly?

Speaker 2: That's correct, and one of the issues that we've always worried about here from the days when I was assessment coordinator even is when you give people access to a lot of data, do they know what they're doing, and again do they know what it means in the first place. Good training is awfully important. I really don't buy into this “train the trainer” thing. It hasn't work well with other things, but certainly not with data now. I can understand having somebody at [redacted] say like our [redacted] who is very patient for one thing.

He crosses enough areas at the college that he could help train, about people in finance and people in academic services? In many cases somebody only knows their own, narrow area and so when they try to train people in another areas they don't know how to put it in context, and it's not very useful.

Researcher: Well do you believe that the use of analytics tools and academic management is worth the investment?

Speaker 2: Yes, absolutely I do because I think that in Higher Ed we have a tendency to make decisions based on our gut, and that's just wrong. A lot of times we aren't aware that there are problems until they are so significant that we can no longer ignore them. Had we been looking at things, had it been easy for us to study data from day to day, or at least from month to month, we would have noticed there was a problem ahead of time and maybe we could have avoided it.

Absolutely I mean I really believe in this, but only with good training and that starts with people at the top, all the way down.

Researcher: Well it sounds like you don't really use a lot of analytics right now to help manage your key performance indicators. You don't use it or?

Speaker 2: It's not available. I would ...

Researcher: Do you know why it's not available?

Speaker 2: Because why well partly because people who run institutional research want to be sure that data are interpreted correctly, and to be sure that they really are cleaned up before people start using them. If you make stuff available in real time, then there are chances for error, and also sometimes people don't understand that you're looking at a snapshot. You say "Well [redacted] says this, and [redacted] says that." They look at the same data, but three days apart and maybe second, eight-week started or something like that and the enrollment data have changed.

There's a sense that because people are likely to misunderstand data it's better for them not to have them at all, and not every administrator likes numbers.

Researcher: You're saying ... I'm going to back you up for one little thing. Data is kept silo'ed in one specific area in order to account for cleanliness of data I think is what you said. Then the second one was training specifically needed for managers. Special managers who don't really like the data, and they're not used to using the data.

Speaker 2: That sounds correct

Researcher: Well that concludes all of my questions. Is there any other questions, or any questions you have or anything you want to clarify?

Speaker 2: No, that’s all

Researcher: thank you very much for your time, I really appreciate it.

Speaker 2: Welcome.

Appendix J: Redacted Participate Transcript

(A sample of a participant transcript)

Researcher: Thank you, [redacted], for agreeing to participate in my study. Again, we are being recorded. You'll get a transcript of this interview. You can look at it later and tell me if everything is expressed as clearly as we think it will be.

Speaker 2: All right.

Researcher: I'm going to start out with asking you about your position, what your position is with [redacted] and how long you've worked for [redacted].

Speaker 2: I'm currently the Dean for [redacted]. I've held this position in a permanent status for a year and a half now. Before that, I was acting. Before that, for 17 years, I was an instructor here at the college. During that time, I had also been an Assistant Dean for about three years for the [redacted].

Researcher: Thank you. The next question is, if you could describe your top three or so primary key performance indicators or goals. For example, what top important things are you tasked to follow?

Speaker 2: As I first read this question, three things come to mind. The first is, of course, number of students enrolled in courses, what we call an FTE, full-time equivalent students. My key responsibility towards the provost, what my provost would say is, my big responsibility is to increase the number of enrollments within my division. That's coming from her. That's the thing that's most important to the provost.

To me, my second key performance indicator that I keep in mind all the time is, what am I doing to make the programs in my areas stronger and/or better, or keep them up to date? I'm always concerned with the level of academics within my program area, a little less tangible. Number of students is fine. You can measure that. Having a good, solid academic program, I feel is a big responsibility that I have.

Then the third one, I would say, is working with faculty to maintain … I don't want to use the word happy, but … to maintain an effective group of faculty, making sure that they have what they need to teach their classes, making sure that I meet their needs in order for them to do their job correctly. Then there's probably about 20 other smaller things that I

do on any given day. There's dual enrollments. There's community outreach. There's student issues that I have a lot of responsibility for, student complaints, student recommendations, student grade issues. I don't consider those the primary role of an academic dean.

Researcher: More of a secondary …

Speaker 2: Yeah. Yes. I have to deal with them. They're part of my job description. But, I don't think about those every day, which is really unfortunate, because that's who we serve here. I don't see many students unless they're in trouble.

Researcher: Can you choose one of those KPIs and describe how you manage one of those?

Speaker 2: The first one is the easiest one, which is the increase of enrollments. How do I manage it? I can't say that I do it on a daily basis, because it's only when it is setting up the schedule that we are looking at numbers. We set up a schedule such that it meets a target enrollment. The college has target enrollments, and then each campus has target enrollments. Then, likewise, each division has the same target enrollment as the campus. I need to show that I am increasing my numbers by … If the campus enrollment is .6 percent we need to increase by, then I need to make sure that the schedule, as it is set up, would allow this division to increase by that percentage.

It's in scheduling that we look at it and then when students are actually enrolling. Then we have something that's called "keep and cancel," where we look to see what the enrollments are and whether it's worthwhile to keep a course or not.

Researcher: Bouncing off that idea, can you describe the kinds of data you use in order to manage your enrollment?

Speaker 2: Right now, for the first part of that, which is setting up the schedule to see if we would meet our target enrollments, we really have two people here on campus who work on that. One is the what we call the scheduler. She has worked with all the assistant deans on putting together the schedule. There's another person in her office who then looks at those numbers and says, "Okay, you have," for example, "four sections of Accounting 211, and four of those classes seat 30 people. Therefore, four times 30, if that class runs, that's 120 students. That divided by 15

credits, which is a full-time equivalent student, is the number of FTEs those four classes will produce."

How we get that information is assistant dean and the scheduler work on the schedule, put the classes in. Then the other person, again … the only thing they're using is a spreadsheet, using Excel … determines how many potential FTEs could be created. Right now, we're looking at the fall schedule. They looked at it and said, "But Celeste, if these are the only courses that you are offering, your numbers aren't going to be as high as they potentially could have been the semester before." In that regard, we're at the mercy of this one person who provides us this information.

Normally, it's coming to us almost too late to do much about it. Actually, I say that, to do something about it for the printed schedule, because that's what I'm talking about. Once we get those numbers and we see where there's deficiencies, then the printed schedule goes to press, and then we continue to add courses online. That's what we're doing now, is looking at it, and high-performance courses … courses that we know a lot of students enroll in … we are looking to perhaps add more sections of those.

From the other end, in terms of looking at when the students are actually signing up for it, we have a report that's put out by our centralized system called the SEMR Report, Student Enrollment Management Report. That just shows all the courses within my division for a particular semester, and what's the maximum number of seats in that course, and what in a particular class, and how many students are enrolled in it. Then we look at that and determine whether we're going to keep the class or not.

I don't know if you're aware, we're going to what we're calling On-Time Registration in the fall, which means that students will not be able to register late for classes. Next fall, we're going to be offering 16 weeks and then some 14-week courses, because now a student won't be able to get into a 16-week course if they're … They won't be able to register late for a 16-week course. We're trying to think of a way that we could still capture them for the semester, and so we're putting in some 14-week courses as well.

Researcher: That's actually quite interesting. Can you think of how you use analytic tools in the management of your daily activities?

Speaker 2: How I do use them?

Speaker 2: Yeah. I will say, quite frankly, that we don't use it much, other than those two times of the year, build a schedule and when classes are starting. The rest of the time, we're not doing too much.

I will add that there is a new system … I don't know if you've heard of it, it's Claris… that is taking the data out of our existing student information system, and it's getting loaded into this other system called Claris, which, for the first time, is going to allow the deans, the assistant deans, the people who are working on schedules, to be able to look back and see, "Historically, you've offered this course at 6:00 on a Monday night. Every other year, it has a lot of students. In those intervening years, it has very few students." Or, it will show you, "Oh, look. Look at the past five years. A class being offered at 6:00 at night, the enrollments have only gone down, down, down."

Researcher: You start to analyze, using data, instead of it just being more static.

Speaker 2: Right. For me, the challenge will be finding the time to look at this. Just as we took this little training session, it's available to me now. On any given day, I don't have much time to be forward-thinking. We tend to react as a … We are trying to pro-act, and it would be good if we could.

Researcher: I know you've talked about this, but if we could just clarify. If you could describe your experience using technology to exceed your performance goals.

Speaker 2: Yeah. We have very primitive tools to do it. The fact that it's one person sitting in an office, for the front-end part, determining what our efficiency would be, that's pretty primitive. Where also, that person is very … I want to say … hard-working, very cooperative, but Excel is limited in what it can do. We're just starting to move in that direction, but we're not there yet.

Researcher: I know you talked about Claris and this new system. Can you tell me what kinds of IT applications you believe would help you accomplish your goals more effectively? Like the Claris, do you believe that's going to help, if you have the time to use it?

Speaker 2: Yeah, I think it will. Because we talk so much, we make decisions based on anecdotal evidence. We base decisions on our experiences or our gut. Some of these decisions are being made at the assistant-dean level. If it's

an assistant dean who's been around for a while, then the decisions are better. If it's a new assistant dean, then they're not as good.

Researcher: You're not making the decisions based on data, per se, you're making it more what we've always done and what works?

Speaker 2: Sometimes it's what we've always done and it works. Sometimes we make a decision not to do something because we've done it before, and it didn't seem to work. Whether if we actually looked at that … because as I well know, what you think you know might not necessarily be the case. The data might show something else, something that we weren't aware of. Because we've never had those tools, I can't say that we've been there.

Researcher: Okay. I think that you said that you had some training on this new Claris system. Can you describe any training you have received using analytic tools in your workplace?

Speaker 2: Little to none. Yeah.

Researcher: Okay. Do you believe the use of analytic tools and academic management is worth the investment?

Speaker 2: I think it would be worthwhile. I have to mention that we also have [redacted] here at the college, who can provide a lot of analytic information, but it's a centralized organization, and it's a very closed part of our organization. We have a very difficult time to get information from them as well as … I forget where the point where I was going. Because there's only one of them and it's centralized, frequently the requests that we make are not honored.

Researcher: It's not information that you have yourself in front of you that you can get instantly?

Speaker 2: No, no. It's six months old by the time we get it, if even that.

Researcher: It's not real-time. If you do not use data and analytics to help manage your key performance indicators, can you explain why? Why not? Why don't you have them available to you?

Speaker 2: I think it's because we're a very large bureaucracy, and we move slowly. I think that, despite the fact that these kinds of tools I know are available could be available, getting around to using them takes a long time for

someone to take responsibility and get it in place and, therefore, get it to us. I also think that, politically, we don't have access to this information because of that central organization.

Researcher: It's closed and siloed information that is not shared?

Speaker 2: Shared, yeah. Yet, it would be very useful to be shared.

Researcher: Okay. That was my last and final question. Is there specific areas you'd like to clarify a little bit more, or any other questions you have of me?

Speaker 2: No. I will say that the whole time, though, in the back of my mind, you're talking about technology … This doesn't fit in there, but it's … I spend a lot of time on e-mails every day. I spend more time using that technology than anything else.

Researcher: That would, you think, be your greatest … that and spreadsheets, Excel, those two items.

Speaker 2: Yeah. I think there's room for improvement and would look forward to the opportunity to have some useful but easy-to-use tools. I don't like to get bogged down in learning to use a tool.

Researcher: Okay. That makes a lot of sense.

Speaker 2: Yeah. Yet, we, as an organization, are being … We don't have tools, but we're pushed to account for things, like retention and number of graduates. I'm not involved in that, although I could be. What was I going to say?

Researcher: More analytic tools, you think, would-

Speaker 2: Would definitely help in that regard, yes. I think something in here said something about retention. Yeah, but I could see, from a data analysis point of view, what students we are retaining. I think it could point out where some of the weaknesses are. When I say I talk about faculty, where the weaknesses are in maybe a faculty training something, or a particular faculty member who might …

Researcher: You could definitely look at your students as a whole and see where they're dropping out most of the time. You could probably see what classes they might be dropping out of at a greater rate. Analytic tools will help you do this. Right now, you're saying, that basically everything

is in siloed different areas. If the information gets to you, it's probably six months old, and there's nothing available for you to really help assist …

Speaker 2: Yeah, there really isn't. Yeah, yeah. Yes, that's true.

Researcher: Thank you very much. At this point, I'll stop the recording. You can expect your transcript next week. Then we'll go from there.

Speaker 2: Very good.

Researcher: Thank you.

Speaker 2: Thank you.

Appendix K: Redacted Participate Transcript

(A sample of a participant transcript)

Researcher: Thank you, [redacted], for agreeing to being a participant in my study and, um, you've signed the consent form and you know that, uh, I am recording this and you can stop this interview at any moment for any reason. If you're comfortable with that, I'll go ahead and start with the first question.

Speaker 2: Please, go ahead.

Researcher: Alright. What is your position within [redacted] and how long have you worked for [redacted]

Speaker 2: I work for everybody. I am the clerk to Eva. I am the clerk to HR. I am the ... I work for clerk approvals. But, my official title is Dean of [redacted]. I've been here for about 7 years.

Researcher: Can you explain to me maybe your top three primary key performance indicators or goals? For example, top important things that you are tasked following or being accountable for.

Speaker 2: As an academic Dean, my mission is to support education. We do that, as most colleges do, with work load indicators. So probably the number one work load that I get beat up about, the number one thing I have to keep up with, is how much am I, uh, how many more students am I teaching this year than last year and how do you measure that. As a secondary measure, there are a lot of HR things I have to do like doing performance evaluations and, I'll call them housekeeping chores and they rotate on a predictable cycle, but whenever something's top dead center, you've gotta go there.

Grievances, complaints, grade appeals, things like that are issues that would be great to keep a handle on. Uh, I may think of others as we go along, but, but you know, everyday is a real treat. You kinda roll through what works.

Researcher: Well, can you, uh, take one of those, for example, and describe how you manage a particular goal?

Speaker 2: With terrific difficulty. Everything is manual. And frequently the metrics that are provided by the college are out of date, hard to get,

or have to be derived from other sources. For example, I have no idea how the budget process works. I'd love to. I'd love somebody to lay it down and explain it to me. They manage our organization based on FTES, that's full-time equivalent students. And, so if you do a certain amount of work in a given discipline, you've justified two full-time faculty or seven full-time faculty or whatever. But think about how extraordinarily poor metric that is. Doing, uh, fifteen FTEs of work in a math class where there are 45 people in a room and they come and they sit for three hours a week and that's it, is nothing like doing the same number of FTEs in a clinically intense course that has five hours of lecture and ten hours of lab and fifteen contact hours of clinicals and to compare the two is such a case of apples and oranges, you just can't get there.

However, everything at this college is done on FTEs. I just right now making it a case for keeping a faculty member that some of the resource managers say is clearly an area that's over resourced. Using FTEs that particular discipline can justify 1.7 faculty. Crawling under the hood though, and looking at the data, and again, it's manual and you gotta go to a lot of work to get it, I find that that discipline only sold 600 credits last year. At 30 credits per FTES per year or 15 per semester, that would equate then to justifying 1.7 faculty. I have three. Clearly, I appear to have one too many, at least. But when I look at how many iterations of each lab and the fact that I only have four stenography, ooh, I said it, four, four lab pieces of equipment to use, uh, I can do absolutely no more than eight students at a time with one pretending to be the patient and one pretending to be the discipline specialist.

Researcher: So, you're saying you're tracking the FTEs, that's one of your main top goals, what kinds of specific data do you use? Do you use applications or do you use databases or ...

Speaker 2: Well, the college is ... the college's official data set is people soft, and, uh, I am able to go in on either the AIS or SIS, that's the Administrative Information System, uh, or the Student Information Services system and get information from it. On any given day at any given moment, I can go in and ask it to give me a report by division. I can tell you how many head count, unduplicated and duplicated head count there are or how many FTEs there are for that discipline and this semester, last semester whatever period of time I look at.

What the college has a high propensity to do is to go and trend this time last year against this time this year. What changed? Recently, we had a grant in the, uh, area of medical education campus that gave us fully funded scholarships that amounted to hundreds of students per semester. When the grant dried up, our work load dropped by hundreds now.

Researcher: But that's hard to tell what you're saying probably from the database.

Speaker 2: You have to derive what was different before, after and during the period to show the aberration that was caused by the grant. But the casual observer looking at the normally available instruments she says "Why is your workload down so much?" And you've gotta work behind that.

Researcher: So can you think of how you used analytic tools in the management of any of this?

Speaker 2: Wow, what a question. It is my perception that the college does precious little training on how to use the available tools. If you punish yourself to blunder through it til it works, you can get data from it. Most of what I do is I pull reports and put them into spreadsheets. Uh, I may privately use software purchased in simulation models or in different, uh, object driven models to help me get a handle on something, but it's not provided by the college.

Researcher: My next question is kind of the same sort of, rendering of information describe your experience using technology to reach or exceed your performance goals. And so, I'm just hearing that you use a lot of spreadsheets, different databases, um, perhaps personally purchased ...

Speaker 2: I have a background in business process re-engineering. One of my favorite tools I privately purchased and was therefore able to keep was a product called I-Think, uh, by, uh, started at MIT now it belongs to Stella Systems, but it's a objects driven analytic software with a feedback and adjustment, uh, simulation models, hence, it's fairly easy to use otherwise I probably couldn't handle it. Uh, but it lets you, uh, set in motion a number of different modules, ghost them off of each other, and then over time, see what the impact is of your decisions, if you can craft how you're working your model. That's sort of what if drill the college does

not do well. And, and if you're trying to make an argument you almost always have to do it. It is a fact at Nova that they will say if you go do X, we'll resource it. And it is my approach to always say if you'll give me these resources, I will do X. The two are incompatible. So their decision making is tough in that environment.

Researcher: So what kinds of IT applications do you believe would help you accomplish your goals more effectively? Um, you've just mentioned this analytic tool, I-Think. Is there

Speaker 2: I understand your question. I wanna go way back upstream from the question and say the first thing the college needs to deal without any address at all on what any analytic tools is decide what it's requirements are. I don't think we've ever agreed as a community on how to measure performance. Somebody wants to, to make a hole in something, they buy a drill. They don't want a drill. They want a hole. The college wants more money. What does it really want? Does it want more graduates or ... what are we measuring? What makes better, better? I don't think the performance metrics have ever been defined and a lot of yield would come out of just doing that. Almost probably always an organization wants to be more efficient. That's dollars per unit. Anytime you're measuring dollars per unit, you've gotta count units, you've gotta count total money spent, whatever you're doing the per unit cost are and you do it. Efficiency.

What if what you're measuring is satisfaction? Then how do you do that? Do you do it by customer survey? Do you do it by repeat business? How do you measure satisfaction? What if you're measuring timeliness? Forget about the cost per unit. Can I do something today ten times faster than I did it yesterday? And if I can, then knowing that and building a system that delivers it would be great. Sadly, I don't think the college has ever addressed what is it we want to measure. So what happens is every Dean, every Vice President and every Provost has their pet rocks and manually we craft someway to kinda get a handle on what that is. Usually, it's how many students do you have or how many FTEs are you doing.

But at the deeper sense of this, when I look at ... when I look at workload at the [redacted] and I look across all ten disciplines we teach, from year to year on a five year period I recently analyzed, we start a hundred students per year and continue 69 in year two. Or in

other words, we have 69% retention rate. Without starting any more students, without increasing the size of any program, I could increase my revenue and, therefore, my work load by simply not losing any.

So the metric I'm after is not so much how big can you get, but how many of your students can you retain. That's measuring something totally different. I think going down the road, it would help us to kind of really crystallize what it is we're after. Uh, at the medical education campus, people say get bigger and I push back and say "Can't." And they,

Speaker 2: They insist that I try and I say no . In all of [redacted] and [redacted], there are 45 clinical rotations in radiography and I'm doing that. I can train you a thousand [redacted] students in a lecture, but I can only rotate 45. And I can only graduate who gets rotated. So frequently, as in most complex systems, the things we're talking to are what's the constraint? How do you make it better? It's systems theory. If I were running a car manufacturing company and I had two divisions, one that made power trains and engines and the other division made the body and everything else. And I told both these Vice Presidents to go out and make more and they came in with plans. The guy making power trains said "I can give you a ten times increase with these resources." And the guy making bodies said "No matter how much money you give me, I can only give you a two times increase." A prudent manager would say "Okay, then everybody double what you're doing." We don't do that. We have somebody out there making "I can make you 200% of this" and whatever it is contingent upon can go up by 10% and we're wondering why we're out of balance. We are a complex system. We do not balance the big picture. We tend to try to optimize the littler pictures and there are no built in dashboards or analytics to give us that help.

Researcher: Currently?

Speaker 2: Currently.

Researcher: Okay. Um, I think

Speaker 2: Good point. There could be.

Researcher: I think so. But, um, I think you had mentioned training, but my next question revolves around any training that you have received in the use of analytic tools in your work place. And I think I know what the answer to that is.

Speaker 2: When I came on board 7 years ago, I had a two afternoon session being oriented to AIS and SIS. And since that time, have had nothing except what I taught myself. Uh, there is a E-Middle ware and I forgotten the name of it, hopefully somebody else you talked to will remember it, uh, that is a product that [redacted] purchased for us to be able to use that would deliver reports but my problem with that middle ware is it is only as good as the data. And the data in the system is not timely and not accurate. So if you have a dashboard that is giving you data that was accurate as of 6 weeks ago, man, that could be a problem. Because when I look at budgets, especially at this time of the year as we approach the end of the year, knowing that I have on paper half a million dollars left but failing to reconcile the fact that I've got $485,000 worth of outstanding checks, could cause me to make a very bad mistake if I just spent a half a million dollars. It's gotta be more timely. I mean ... It's not there.

Researcher: So do you believe the use of analytic tools in an academic management is worth the investment? Being able to push things on a 24-hour time basis, pushing you information, gathering, something that is on top of SIS and people soft and other discreet database and kind of gives you that information on a timely manor. Is it worth that investment?

Speaker 2: Well, up to a point. I mean, everything can be priced out of its market, but better management would be better. I, uh,

Researcher: Better management of the data?

Speaker 2: Yeah, better management of the data, better dashboards, better ability to make decisions. Timely information always helps you. I mean, if Washington had better information when he crossed the Delaware, he might have done it during the day instead of at night or something. You get the idea.

Researcher: Okay. Well, if you do not use data, uh, analytics to help manage your key performance indicators, can you explain why, why not? Which I kind of think you have explained it but ...

Speaker 2: It's not there. I mean, it ... How do I say this? The college looks at FTEs. I like to look at costs. For example, the Human Resources system, when I need assistance in [redacted] training, for the hands on labs, my affiliate, my accreditation body says you can't have more than 6 students in a lab section. Uh, HR says "Well, all of your professors should be credentialed, adjunct or full-time faculty. If I use a full-time faculty it's $2,000 - $2,500 a credit. But using adjunct it's $700 a credit. If I use a credentialed paramedic who cannot be a faculty member but can support my credentialed faculty member, I can put together a set of 60 students in a single lab, one section of which is managed by the credentialed professor and five by the students. I mean, I'm getting to a point here, the idea is that that paramedic cost me about $20 an hour or in a 16 weeks semester, $320 a credit. So the staircase is 320, 700, or 2,000 a credit. Which is better? The college incentifies me to do the 2,000. And makes me fight to do the 320. If you just put that in front of me or anybody else that's got a brain, they'd say " Ah, let's do it the best way. Let's do it the most efficient way." That day is not there. So, yes.

Researcher: So you're saying

Speaker 2: If you give me the right information, I'll make better decisions.

Researcher: So, timely data?

Speaker 2: Well, timely and access to.

Researcher: Access data.

Speaker 2: I can sit down with any one of my programs and I can count how many students are in a class, how many credits a class is, multiply it by 153.25 and know what the revenue is. That is not what I get. Where does the rest of that go? Not because I have to know, but just because somebody ought to know. How do we go about making that decision? You walk around this building and you see some offices with very large flat panel tvs on the wall. For what? They're not a video center, they're hopefully not watching tv. Why do you need that ... why was that a better expenditure of funds than maybe five tablets to be used for testing in one of the testing centers? There is no relative playoff between good vs better decisions. We just kinda muddle along and do what we always did.

Additionally, every Vice President, every Provost, every Dean gets their pot of money and always needs more but will not give you any of it for any reason. We do not optimize the big system. We all seek to make our little parts of it better.

Researcher: Well, thank you. Was there anything else that you wanted to clarify or add to ..

Speaker 2: I'm going through this for hours, I guess.

Researcher: Okay.

Speaker 2: I think we'd be much richer if we had better data. I think that some people are not data thinkers. Some people love spreadsheets, some hate them. Some people love Power Points, some hate them. My ... Different kinds of folks but there oughta be a way I can either give you a picture or words or numbers to help you make decisions and right now the only way to get there is to sit down and do your own private, very labor intensive study. So, yes. A better dashboard, better access to that. Understanding it. One of my favorite ...

Researcher: Training component.

Speaker 2: Yeah, there's a book that was developed more than 20 years ago by a guy named Michael Gerber. It's one of those "Who moved my cheese" kind of books, titled The E-Myth. I think this college and any other large organization can take a note from it because in the book, E stands for entrepreneurial. Gerber sites that the thesis, if you will, that everybody knows they're smarter than their boss. And so they quit their job and they go into business for themselves and they succeed wonderfully in the text of the book until they have to hire the second employee. And then because the new employee doesn't know or understand what the nature of the business is, it begins to get less good. I mean, the quality goes down, everything begins to fail. Because good and noble people who are successful always work nobly and hard in the business, but tend not to focus on the business.

[redacted] is full of people who have worked horrendously hard in the business of community college education. But there is almost no effort being given to working on the business of that community college.

We need processes. We need repeatable processes. We need metrics. We need people who agree on the shared vision and the big picture. We're not there.

Researcher: Okay. Great. Well, thank you for this interview. I really appreciate your time and I'm going to stop recording now.

Appendix L: Redacted Participate Transcript

(A sample of a participant transcript)

Researcher: Thank you for agreeing to participate in my study.

Speaker 2: My pleasure.

Researcher: I'm going to start out with the first questions which is, describe your position within [redacted], and how long have you worked for [redacted]?

Speaker 2: I have been at [redacted] since July of 2012. June of 2012 actually. I'm the [redacted], which is a position that fundamentally had the "duties as assigned."

Researcher: Everything just comes on to your plate.

Speaker 2: Or not.

Researcher: Can you tell me what are the top three primary key performance indicators or goals for your position? For example, what are the top things that you're tasked to follow?

Speaker 2: Our ability at [redacted] to provide as much financial aid, federal financial aid in particular, to students as humanly possible within the compliance requirements of the Department of Education. That's, I think, probably the most fundamental because it's the most supportive of students. That's a key thing that I'm working on right now. That's a lot of technology, so we'll cover that in a few minutes.

Interestingly enough, a pretty mundane one is tracking the history of faculty positions, because positions are capable of being reallocated. Some are restricted. Some are regular full-time positions. We have to put our resources where the need is. The resources are limited, so that's a very highly database-oriented tracking.

I have a whole raft of things, but I'm trying to focus on things that require and need data and benchmarking in order to follow. Simple

things like what are best practices in advising students. You think about student's success, what does it mean to be successful as a student?

Speaker 2: Also, let me talk about the curriculum as another area, because when you're deciding what programs to offer, the kind of information you need to know is what happens to a student when they finish this program? If they are in a particular area, what skills do they need to have, what competencies, and what credential do they need to have? Are the students going to be employable at the end of what we do? Do they need to go on and transfer? You need employment data. You need to know what kind of things hiring managers are looking for, for example. That's not easy to come by.

The other is when are you going to turn off a program? Why? Does it just need revision, or is it really totally out of date? You need data to do that. Those are three things, the curriculum, faculty strengths and history, who they are, and on my plate right now financial aid is important.

Researcher: Can you choose one of those top KPIs and describe how you manage that, maybe on a day-to-day basis or weekly basis?

Speaker 2: Yeah. Let's talk about financial aid, because it's what I've been working on recently. [redacted] gets about forty-four thousand FAFSA forms, financial aid applications, federal financial aid applications, to process every year. The length of time it takes to process one of those applications determines whether or not a student is going to have any financial aid awarded to them in a timely manner. The first questions is, what does a timely manner mean? That means when do students need to have their aid in place so that they can be in class on the first day with their books ready to play. You've got a timeline question.

Then you've got a question of how long does it take to process from the receipt of an application to the award, and how do you know you're doing well or poorly? The only way you know that is to benchmark yourself against other institutions. You've got to figure out, okay, what are the indicators that you would want to use to benchmark yourself? One could be what fraction of your students that are enrolled actually get federal financial aid? That's very easy to find, in IPEDS for example.

Another question might be, from the date that you received the application, how long does it take for the award to be posted to the student's account? Long, short, and what are other people doing? What can you do to change either the behavior of students to get on the ball and get things done, or the way you process things. Benchmarking on time, benchmarking on fraction of people with aid, and weighing that against the timeline for enrollment and registration of institutions. Those are all measures you might use.

Researcher: Just curious, and this may not be a part of this, but how are other universities ... I don't think IPEDS track that information do they? How easy is it to get the information from other universities?

Speaker 2: You have to have a relationship built up among and between financial aid offices so that they would be willing to share data. Even more interestingly, you have to ask the right question with the right detail. You might say, "Okay, twenty-eight percent of our students got a Pell Grant." That requires how many Pells were there and how many students do you have? Do you count only the students who would be eligible to get a Pell Grant? Do you count all the head count? In other words, do you count the senior citizens that come to take a class at a community college? Counting workforce or not?

How you ask the question and how you define this is very important ... and then when you go out and ask it, you have to be sure that the people answering it are answering it with the data the way you want it.

Speaker 2: IPEDS does do the percent of Pell. It does not do the time activity. That's really tough to come by, because some applications are not chosen to be verified by the federal government.

Speaker 2: About thirty-eight percent get verified.

Researcher: Can you describe the kinds of data you use in order to manage this process?

Speaker 2: It's financial data. How many dollars in aid are being given out trend-wise, year by year by year. How many students are getting ... typically trends. You want to know whether this is happening and are you giving more aid out? Is aid increasing faster than your student body is increasing, because then what's happening ... Then

you're learning, okay I am actually getting more aid in the hands of more students. It isn't just that I'm giving more aid because I have more students. In the time when you're growing, which we were for a long time, the growth rate of dollars in financial aid far exceeded the growth rate in the student body, which says we were doing a better job. That's a measure that you could use.

Dollars, number of awards, processing time ... These are all longitudinal. You've got to ask the question, what was it last year? How long did it take? If a student submitted a FAFSA in June, when did they get their award? Okay? If they submitted it in June of 2011, June of 2012, and June of 2013, how long did it take? Is the time to process that shrinking, because then it's say, you're becoming more efficient. The students are ready to play when they get in class.

Researcher: Can you talk about how you use analytic tools in the management of this tracking? Any analytic tools that are available to you that you use.

Speaker 2: I've been using QUIN because the financial aid piece is up. It is ... I wouldn't say it's a dashboard-like activity yet, but it could become a visual dashboard. Frankly, what you would want to look at there would be trends. You would want to have multi-year data, maybe a three-year trend. The great thing about QUIN is that it has pretty good ability to drill down into the data, down to the individual student. That means a wide range of people could use it for different purposes. That's just coming out, so I think that's one area.

I use a lot of researcher parts from NCHEMS. For science data, the NSF.gov has a lot of how many degrees in various sciences are being awarded.

Speaker 2: Census data. Interestingly, census data and population data and trends by geographic things on the census site are valuable. When you're thinking about ... If you have a multi-campus institution, and you want to ask, "Should we be offering this program [redacted]?" You can ask, "What is the demographics of the area where we are offering it, and where would it be successful out there?" It gives you some feel about how your curriculum would go. I don't know if there are any analytic tools, or if those are just databases. What is it they say about big data? Just because you

have a lot of data doesn't mean you're a big data, unless you can ask the right questions.

Speaker 2: The new programs that are out, these data programs are called data analytics.

Researcher: Can you describe your experience using technology to reach your goals? I know that you had mentioned IPEDS which is the financial aid government, federal government data base.

Speaker 2: Using technology generally?

Researcher: Generally and specifically if you have specifics.

Speaker 2: I don't know. I'm a data freak, so it's hard to say. I can't divorce myself from data and technology and ... I try to find the tool that is most valuable to do what I want to do. Then, if I don't have something I want to do with it, I don't just play with it and learn now to use it. I find it's much easier to have a project that you want to work on and use ... When Lotus came out, the first spreadsheet stuff, it's great, but unless you've got to make a spreadsheet for something ...

Researcher: ….apply it.

Speaker 2: Right. You're just playing around. You don't learn it that way.

Researcher: I know that you probably use lots of different databases.

Speaker 2: Yeah. I'm a MAC person, so I use databases ...

Researcher: Databases. You use People Soft, SIS ... Those are the big ones in use at the college.

Speaker 2: HRMS

Speaker 2: There are a lot of databases, a lot of information that's reduced at the Brookings Institution. The Council on Education has a lot of reports. Those aren't really databases, but they point you to where the data came from.

Researcher: If you could dream a little, what kinds of IT applications do you believe would help you accomplish your goals more efficiently or more effectively?

Speaker 2: There are some new programs out that help you visualize large amounts of data. I was just playing around with some of them. I can't remember the names of what I was playing with. When I looked at them ... What they do is take ... They allow you to cut data vertically, horizontally, diagonally, in three dimensions.

Researcher: many different discrete data-

Speaker 2: Exactly. More than just a pivot table or something like that. Then you can visualize and you can do “what-if” scenarios. The problem with those right now is they have a steep learning curve. They are only now beginning to become user-friendly. I've used Crystal reports to sample things. I think, frankly, that the big thing at [redacted] would be to provide a way for people, provosts, deans, and others, to sample our large databases in a way that-

Speaker 2: will create an Excel spreadsheet quickly, instead of having to use institutional research as the only source of all-data.

Researcher: Can you describe any training that you have had here in the workplace in analytic tools?

Speaker 2: I'll give you my philosophy. If I have a project, I go learn it. I've never had a problem-]

Speaker 2: ... because I have a motivation to do it. Right? Whereas, if I were required to go, back in the days when the system came out, to go to Excel training, I would have said, "Just give me the program, and let me play with it."

Speaker 2: I'll figure out what I can do with it.

Researcher: Do you believe the use of analytic tools in academic management is worth the investment?

Speaker 2: Worth? It's more than worth the investment. If you are not data driven, forget it. You can't run a college with a large amount of public dollars on anecdotes.

Researcher: If you don't have analytics right now in your workplace to help you with your KPIs, your key performance indicators, can you explain why or why not?

Speaker 2: I have everything I need or I go find it. That's just me.

Speaker 2: I have to see it on a spreadsheet, a number, or graph, not in a narrative. That's just me.

Researcher: An analytic tool ... You say that it would be useful and it's worthwhile. However, the organization right now does not ...

Speaker 2: The visualization tools, I think, which are coming online and online versions of them ...

Speaker 2: The use of something called Omnigraph, or something like that, which is not a visualization tool for data but rather is a way to organize your thinking. Prezi is another presentation one.

Researcher: Getting back to analytics here in the organization, do you know of any barriers that there would be for the institution to not adopt an analytic tool for it's management staff, deans, assistant deans, ...

Speaker 2: Remember, we are [redacted]. We're the biggest. The complexity of what we do is far beyond anything ... [redacted] approaches it, but not in the way we do. The amount of data we have to deal with, the complexity of what we deal with, does not fit or is not needed at [redacted] or [redacted] with four hundred students or whatever. They can get away with a lot of manual stuff.

Speaker 2: We have to convince the system to do things for us that aren't needed by [redacted].

Researcher: So, it would be-

Speaker 2: We're limited ...

Researcher: Politically, bureaucratically ?

Speaker 2: Yes. You're correct.

Researcher: That was my last question for you. Was there anything that you wanted to clarify, or any questions you have for me?

Speaker 2: No. I think when we covered everything.

Appendix M: Permission from Community Partner to Perform Research

(This represent the letter from College Z giving permission to use the College for data Collection and research purposes)

December 18, 2013

Dear Ms. Pomeroy,

Based on my review of your research proposal, I give permission for you to conduct the study entitled Academic Analytics: Barriers to Adoption within [redacted]. As part of this study, I authorize you to:

Interview academic personnel in order to explore barriers to the adoption of analytic tools in a higher education organization. The interview questions will be adapted and modified to meet the needs of the study by Venkatesh, 2008. The individuals whom you will interview will meet criteria based on their academic management roles. In the event there are fewer participants due to unexpected circumstances, you can easily contact members from the original list of prospective participants.

The participants will be reminded at the time of the interview that their interview is voluntary and that confidentiality will be kept. You will remind the participants that they can refuse without reason, to answer any question. The participants will be told that they will be able to review the transcript of their interview in order to make certain their answers are appropriately recorded.

The interviews will be conducted within a time frame of four weeks. Each individual participant will schedule the interview at his or her convenience. The data that will be collected during the interviews will be transcribed and coded using the computer software NVivo or another appropriate software.

When the participants exit the interview session, each interviewee will be asked again to verify their contact information. This will be done so that the transcribed interview can be sent to the interviewees for review. The participants will be sent, by e-mail, the transcribed interview so they can make any adjustments they feel necessary.

Individuals' participation will be voluntary and at their own discretion.

We understand that our organization's responsibilities include:

We will work with you in order to provide an appropriate criterion-based list of possible interviewees. The interviews will take place in the office of the individual participants; this is deemed necessary, as the time an academic manager would lose leaving campus was valuable.

We reserve the right to withdraw from the study at any time if our circumstances change.

I confirm that I am authorized to approve research in this setting.

I understand that the data collected will remain entirely confidential and may not be provided to anyone outside of the research team without permission from the Walden University IRB.

Sincerely,

[redacted]

Walden University policy on electronic signatures: An electronic signature is just as valid as a written signature as long as both parties have agreed to conduct the transaction electronically. Electronic signatures are regulated by the Uniform Electronic Transactions Act. Electronic signatures are only valid when the signer is either (a) the sender of the e-mail, or (b) copied on the e-mail containing the signed document. Legally an "electronic signature" can be the person's typed name, their e-mail address, or any other identifying marker. Walden University staff verify any electronic signatures that do not originate from a password-protected source (i.e., an e-mail address officially on file with Walden).

Appendix N: Pilot Study Consent Form

Pilot Study Consent Form

You are invited to take part in a research study of Academic Analytics in Higher Education: Barriers to Adoption. I intend to explore the extent to which Higher Education academic managers use academic analytics to manage their key productivity indicators. The researcher is inviting persons who have key performance indicators, which are measurable, who would have the necessity to use analytic tools in order to assist them in meeting their goals to be in the study. An example of a key performance indicator for an academic dean is to retain a certain amount of students in a program from one semester to the next. This form is part of a process called "informed consent" to allow you to understand this study before deciding whether to take part.

This study is being conducted by a researcher named Willie Pomeroy, who is a doctoral student at Walden University.

Background Information:
The purpose of this study is to explore the extent to which Higher Education academic managers use academic analytics to manage their key productivity indicators and any barriers that prevent the adoption and use of analytics in an academic setting.

Procedures:
If you agree to be in this study, you will be asked to:

- Participate in a 35-45 minute interview- this interview will be audio recorded

Listed below are the questions:

Can you think of how you use information technologies in the management of your daily activities?
What are your primary key performance indicators/goals?
Describe how you manage your primary key performance indicators/goals?
What is your position within the organization? How long have your worked for the organization?
Describe the kinds of data you use in order to manage your performance indicators/goals.
What kinds of IT support do you believe would help you accomplish your goals more effectively?
Describe your experience using technology to reach or exceed your performance goals.
Describe any training you have received in the usage of technology in your workplace.
Do you believe the use of technology in academic management is worth the investment? Please explain.
If you do not use data and analytics to help manage your key performance indicators, can you explain why not?

After the interview, which will be audio recorded, I will transcribe the interview. I will then send you via e-mail the transcription. At this time, you may contact me to revise any information and review any follow-up questions that may arise.

Voluntary Nature of the Study:

This study is voluntary. Everyone will respect your decision of whether or not you choose to be in the study. If you decide to join the study now, you can still change your mind later. You may stop at any time. There are no gifts, compensation or reimbursements for the participants in this study.

Risks and Benefits of Being in the Study:

Being in this study would not pose risk to your safety or wellbeing. This study will benefit higher education institutions in identifying the potential barriers to adoption of analytic tools that may greatly help academic mangers increase student success, among other key productivity indicators.

Privacy:
Any information you provide will be kept confidential. The researcher will not use your personal information for any purposes outside of this research project. Also, the researcher will not include your name or anything else that could identify you in the study reports. Data will be on a password protected computer and will be kept secure by being locked in the researcher's personal home office. Data will be kept for a period of at least 5 years, as required by the university.

Contacts and Questions:
You may ask any questions you have now. Or if you have questions later, you may contact the researcher via [redacted] or by phone at [redacted]. If you want to talk privately about your rights as a participant, you can call Dr. Leilani Endicott. She is the Walden University representative who can discuss this with you. Her phone number is [redacted]. Walden University's approval number for this study is 01-28-14-0231112 and it expires on January 27, 2015.
The researcher will give you a copy of this form to keep.

Statement of Consent:

I have read the above information and I feel I understand the study well enough to make a decision about my involvement. By signing below, I understand that I am agreeing to the terms described above.

Printed Name of Participant _____

Date of consent _____

Participant's Signature _____

Researcher's Signature _____

Appendix O: Regular Study Consent Form

Regular Study Consent Form

You are invited to take part in a research study of Academic Analytics in Higher Education: Barriers to Adoption. I intend to explore the extent to which Higher Education academic managers use academic analytics to manage their key productivity indicators. The researcher is inviting persons who have key performance indicators, which are measurable, who would have the necessity to use analytic tools in order to assist them in meeting their goals to be in the study. An example of a key performance indicator for an academic dean is to retain a certain amount of students in a program from one semester to the next. This form is part of a process called "informed consent" to allow you to understand this study before deciding whether to take part.

This study is being conducted by a researcher named Willie Pomeroy, who is a doctoral student at Walden University. You may already know the researcher as a [redacted], but this study is separate from that role.

Background Information:

The purpose of this study is to explore the extent to which Higher Education academic managers use academic analytics to manage their key productivity indicators and any barriers that prevent the adoption and use of analytics in an academic setting.

Procedures:

If you agree to be in this study, you will be asked to:

- Participate in a 35-45 minute interview

Here are the questions:

What is your position within [redacted] and how long have you worked for [redacted]?
What are your top 3-5 primary key performance indicators or goals? For example, what top important things are you tasked with to follow?
Describe how you manage 1 of your primary key performance indicators.
Describe the kinds of data you use in order to manage your performance indicators.
Can you think of how you use analytic tools in the management of your daily activities?
Describe your experience using technology to reach or exceed your performance goals.
What kinds of IT applications do you believe would help you accomplish your goals more effectively?
Describe any training you have received in the usage of analytic tools in your workplace.
Do you believe the use of analytic tools in academic management is worth the investment? Please explain.
If you do not use data and analytics to help manage your key performance indicators, can you explain why not?

Voluntary Nature of the Study:

This study is voluntary. Everyone will respect your decision of whether or not you choose to be in the study. No one at [redacted] will treat you differently if you

decide not to be in the study. If you decide to join the study now, you can still change your mind later. You may stop at any time. There are no gifts, compensation or reimbursements for the participants in this study.

Risks and Benefits of Being in the Study:

Being in this study would not pose risk to your safety or wellbeing. This study will benefit higher education institutions in identifying the potential barriers to adoption of analytic tools that may greatly help academic mangers increase student success, among other key productivity indicators.

Privacy:
Any information you provide will be kept confidential. The researcher will not use your personal information for any purposes outside of this research project. Also, the researcher will not include your name or anything else that could identify you in the study reports. Data will be on a password protected computer and Data will be kept secure by being locked in the researcher's personal home office. Data will be kept for a period of at least 5 years, as required by the university.

Contacts and Questions:
You may ask any questions you have now. Or if you have questions later, you may contact the researcher via [redacted], or by phone at [redacted]. If you want to talk privately about your rights as a participant, you can call Dr. Leilani Endicott. She is the Walden University representative who can discuss this with you. Her phone number is [redacted]. Walden University's approval number for this study is 01-28-14-0231112 and it expires on January 27, 2015.

The researcher will give you a copy of this form to keep.

Statement of Consent:

I have read the above information and I feel I understand the study well enough to make a decision about my involvement. By signing below, I understand that I am agreeing to the terms described above.

Printed Name of Participant _____

Date of consent _____

Participant's Signature _____

Researcher's Signature _____

Appendix P: Interview Protocol

Q1: What is your position within [redacted] and how long have you worked for [redacted]?

Q2: What are your top 3-5 primary key performance indicators or goals? For example, what top important things are you tasked with to follow?

Q3: Describe how you manage 1 of your primary key performance indicators.

Q4: Describe the kinds of data you use in order to manage your performance indicators.

Q5: Can you think of how you use analytic tools in the management of your daily activities?

A6: Describe your experience using technology to reach or exceed your performance goals.

Q7: What kinds of IT applications do you believe would help you accomplish your goals more effectively?

Q8: Describe any training you have received in the usage of analytic tools in your workplace.

Q9: Do you believe the use of analytic tools in academic management is worth the investment? Please explain.

Q10: If you do not use data and analytics to help manage your key performance indicators, can you explain why not?

Curriculum Vitae

Willie Pomeroy
[redacted]

Curriculum Design, Evaluation, Analysis: 5 years experience in compliance audits to include SOX, SACS, financials and academics. Prepare for re-accreditation visits to include SACS, MVER, SHEV, and ACICS.

[redacted]
February 2010-Current

I currently assist faculty with the development of Health Information Technology curriculum. I coordinate content area, ensure horizontal and vertical alignment between courses, assist in the development of resources for teacher and student use, utilize research based instructional practices, and assist in the integration of technology into the curriculum (Nov. 2011-Current).

I worked with the HR Department and college personnel auditing and reviewing adjunct faculty credentials for the SACS reaccreditation faculty roster. I assisted Division and Assistant Deans with developing justification requests for faculty who demonstrated competencies in their field of expertise (Feb. 2010-Nov. 2011).

COLLEGE ADMINISTRATION EXPERIENCE
Everest College, Academic Dean July 2007- July 2009

Everest College is located in Arlington, VA. The student population was 700 students. I had 40 faculty and staff who reported directly to me. My responsibilities consisted of the following:
Maintain SHEV, SOX, ACICS, IA Standards- conduct monthly compliance audits
Curriculum analysis and input for Allied Health, Criminal Justice and Business Programs
Implement and establish procedures to ensure quality educational programs
Initiate procedures for the proper management and utilization of all equipment, supplies, and instructional materials
Monitor and evaluate instructional performance methodology, materials, and textbooks
Conduct and monitor faculty training sessions, in-service activities, and regular department meetings to ensure expected performance and growth standards
Recruitment and training of faculty and support staff
Evaluate Faculty effectiveness and determine development goals
Perform monthly audits on cross-functional areas: Academics, Financial Aid, Business Office, and Career Services. Report annually to Federal Database IPEDS.
Monitor Student Academic Progress (SAP)

Continuous evaluation of programs of study to ensure current market and employer demands

TESST College of Technology, Director of Education December 2005-July 2007

TESST College located in Alexandria, VA. The student population is 250 students. I had 23 faculty and staff who reported directly to me. My responsibilities consisted of the following:
Maintain compliance standards through audit checks and monthly compliance reports
Curriculum development and analysis for AH, LPN, and Information Technology programs
Monitor and evaluate instructional performance methodology, materials, and textbooks used to ensure achievement of educational objectives
Conduct faculty development programs, in-service activities and department meetings
Consistently evaluate faculty and staff for effectiveness
Report annually to Federal Database IPEDS.

Central Texas College, Director of Operations September 2003-September 2004

Central Texas College (CTC) is a community college headquartered in Killeen, Texas. CTC holds contracts with the Department of Defense to provide education to deployed military personnel. As Director of Operations for the region of Japan, I was responsible for hiring and training faculty and the preparation for SACS reaccreditation and MIVER evaluation.
Maintained SACS and MVER Accreditation Standards; prepare for SACS review; received MVER review commendation
Reviewed and approved curriculum for on-line and on-site courses
Recommended, implemented and coordinated four new on-site education programs
Developed, organized, and supervised on-campus and on-line faculty development program

TEACHING EXPERIENCE
Teacher & Curriculum Development: High School English and History Fall 1994-Spring 2003
Developed and taught History and English. Reviewed school and district-wide curriculum for all subject matters, assisted in scheduling, restructuring, budget preparation, conferences.
Grant writing: Teacher Learning Project (technology), Smaller Learning Communities Implementation (federal reorganization grant).

EDUCATION
Current PhD Candidate/Knowledge Management – Walden University
Master of Arts/Education Administration – New Mexico Highlands University

Bachelor of Arts/Education – College of Santa Fe
Bachelor of Arts/History – University of New Mexico