Anatomy of Decision Making in Higher Education Institutions:
A Quantitative Analysis of Data Use for Change Management at One of the Largest University System in the United States

A Dissertation Submitted in Partial Fulfillment of the Requirements for the Doctor of Education in Educational Leadership

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Abstract

Anatomy of Decision Making in Higher Education Institutions: A Quantitative Analysis of Data Use for Change Management at One of the Largest University System in the United States

By
Roxana Sayahzadeh Naraghi

Doctor of Education in Educational Leadership

Higher education institutions have unique and distinct characteristics that can facilitate or impede transformational change and decision-making. U.S. higher education has grappled with institutional effectiveness for years. One of the essential parts of institutional effectiveness is the ability and willingness to use data to make quality decisions. The aim of this study was to understand the anatomy of decision-making in higher education institutions. This study provided insight into what aspect of higher educational institutions impacts use of data for decision-making. Data were gathered through a survey instrument administered to mid-level decision makers in one of the largest university systems in the United States. Multiple-regression modeling statistics provided the analytical platform for the research. The results indicated that decision makers perceive data use on their campuses was mostly for reporting purposes and data used for decision-making was not part of their university mission or goals. The three distinct characteristics in higher education validating this finding include their shared governance system, their multiple power and authority structure, and their interdependent organizational nature.
CHAPTER 1 - STATEMENT OF THE PROBLEM

For generations, parents all around the world have used the phrase, “do as I say, not as I do”. Most people do not know the origin of this phrase. The origin dates to the Anglo-Saxons in the 12th Century, who were known to say, “Although I do worse than I teach you, do not do as I do, but do as I teach you if I teach you well” (Bruce, 2010, para. 3). On the surface, the phrase appears to be sound advice, but its purpose might also be seen to try to excuse the hypocrisy exercised by many parents. Although this phrase is not explicitly utilized in organizations, it is often tacitly exercised. Higher Education Institutions (HEIs) are no exception to this effrontery. For instance, for faculty scholarly writings to be considered credible, one must cite sources and provide evidence for the validity and reliability of the information provided. In addition, every student is certainly expected to provide evidence by utilizing citations and references in their research papers in order to obtain a passing grade. Ironically, however, per Leimer (2012), two-thirds of college presidents in a 2011 Inside Higher Education survey, said their institutions are not particularly strong at using data and evidence for making decisions on any level.

Despite the voices of these HEI presidents, evidence-based decision-making to determine the course of action in universities is now a requirement for most accreditation bodies (Leimer, 2012). Evidence not only refers to data gathered from surveys or interviews, but also includes continuous combining of the decision makers’ professional experience, lessons from past errors, and other stakeholders’ voices in the decision-making process (Barabba, 2011). In other words, evidence in the decision-making process refers to data, which may lead up to information, intelligence, knowledge, understanding, and, depending on the decision makers’ viewing lens, hopefully to wisdom prior to making a decision to initiate some form of change or devise a policy (Barabba, 2011). The path to wisdom is long and complex; as poet T.S. Eliot (1934)
writes in his poem, The Rock, “Where is the knowledge we have lost in information? Where is the wisdom we have lost in knowledge?”

There are various views on the importance of evidence-based management including Hart and Bogan (1992) who claim a culture of evidence, or fact-driven management, is important because when leaders make decisions based on assumptions or hunches, it can typically lead to ineffective policies or programs, and can also be very costly for all stakeholders. Yet, there are claims that there is no such thing as a “fact”. For instance, Deming (2000) argues that any two individuals “may have different ideas of what is important to know about in any event” (loc. 846). Thus, understanding facts could be meaningless when making decisions. Organizations, to adapt to the ever-fluctuating environment, are continuously changing. Consequently, decisions are made to determine the type of change, whether the change affects the entire organization or only part of it. Ultimately, the decision makers are those who are accountable for allocating resources in the organization to make these changes happen. To understand how an organization adapts to change and makes decisions, it is crucial to understand the nature of an organization and its characteristics. Organizational characteristics refer to an organization’s goals, its culture and values, and how it is governed. As a result of HEIs unique structure, the role organizational characteristics play in how managerial and operational decisions are made is complex.

According to Kezar (2001), HEIs have multiple organizational realities, which make them unique. These realities include: administration, faculty senate, and other political systems, which exist simultaneously and are actively engaged in the decision-making process. Facilitating change among these internal forces requires a clear understanding of the current state of the organization (Kezar, 2001). This study brings awareness to policy and decision makers on the impact that HEIs organizational characteristics and culture have on data use for decision-making.
and discovers that their shared governance system, their multiple power and authority structure, and their interdependent organizational nature, are characteristics that are most central to systemic reform in HEIs. Ultimately, understanding of systemic reform and the change process in the higher education setting was my main motive in conducting this study.

**Problem Statement**

McClenney, McClenney, and Peterson (2007) refer to the concept of the culture of evidence as change strategies, which focus on the core mission of the institution and rely on historical data to inform the planning and decision-making process. Based on minimal available empirical studies that synthesize culture of evidence as applied to HEIs, it becomes evident that the concept is fairly new to higher education. Research indicates there are various reasons for this gap, including: (a) The HEI leadership’s attitude toward the use of data for decision-making purposes or their lack of understanding of data and their use; (b) an uninvolved Institutional Research (IR) office; and (c) HEIs’ unique characteristics and features. It is these distinctive characteristics, as described by Kezar (2001), that need to be examined to determine which might play a significant role in HEIs’ adoption of a culture of evidence. To determine which of these unique characteristics might play a role in the use of data for decision-making purposes, I selected one of the largest public educational systems in the nation to become the focus of this study. With 23 campuses, almost 474,600 students, and 49,000 faculty and staff, this public higher educational system provided a wide variety of campus contexts to study, all within the confines of one system.

**Purpose and Significance**

This study investigated the relationship between organizational culture and characteristics as perceived by the decision makers of public higher education institutions and their inclination
to use data as evidence to make their decisions. The elements of organizational characteristics include the institutional governance, culture, values, and goals. This study is significant for several reasons. One reason would be that it provides an understanding of organizational change in one of the largest public university systems by possibly identifying unique higher education institution features or variables impacting improvement initiatives. The findings of this study may have considerable impact on policy development and strategic planning on public university systems.

Understanding the political aspect of public higher education systems and resource allocation is another reason for the study’s significance. Knowing that the decision makers are ultimately the allocators of available resources on the individual campuses, this study provides insight on how resource allocation decisions are made. A study of 50 states and their spending on higher education institutions concluded that political characteristics, like interest group activity, organizational structure, and formal powers, determine how much funding each educational institution receives (Ness & Tandberg, 2013). Similarly, the study offers understanding on the extent of political connections and interest groups on funding allocation practices within each campus. The decision makers’ tendency to use data as evidence for decision-making or their perception of the organizational governance, culture, and goals are all variables considered and analyzed. Lastly, Osborne (2012) claims that one element of institutional effectiveness is the ability to use data for effective decision-making. Using data effectively requires understanding it and converting it to meaningful concepts. This study helps in understanding to what extent data is used and understood for decision-making purposes in this public institution. Ultimately, the study concluded that decision making is not the main goal of gathering and interpreting data in this educational system. Although, research indicates that data is gathered and interpreted in
various forms, the main purpose of this exercise appears to be merely to satisfy a reporting or compliance need.

**Research Questions and Hypotheses**

The study hypothesizes that there is a relationship between HEI decision makers’ perceived organizational characteristics and their inclination to use data as evidence for decision-making. This study addresses the following research questions:

1- Do HEI unique characteristics have an impact on using data for decision making?
2- If yes, then which of the characteristics are most influential on data usage?

**Conceptual and Theoretical Framework**

The conceptual framework of the study is based on understanding and facilitating sustainable and effective organizational change in HEIs. The theoretical framework of this study rested on organizational characteristics of higher education institutions as outlined by Kezar (2001) and the inclination to use data as evidence for decision-making based on Barabba’s (2011) decision-making theories. This paper also relies on Deming’s (2000) reference to Theory of Knowledge, where he asserts decisions require rational predictions or theories leading to knowledge through systemic revisions and expansion of theory-based decisions by gathering historical data. The study examined 13 perceived organizational characteristics of higher education (Kezar, 2001) as the independent variables. The dependent variables were then the understanding and use of data by university decision makers to substantiate their decisions. This study provides a common language for understanding organizational change and the decision-making process to initiate and implement transformational change.
Overview of Methodology

To address these research questions, the study used a quantitative web-based survey of deans and department chairs from 12 out of the 23 campuses; this represented just over half of the large, comprehensive system. The average head count for the college deans was 6.5 per campus, totaling the target population to about 78 participants. Snowball sampling was used to conduct the research, where the deans were asked to forward the survey link to their department chairs. This form of sampling has the advantage of recruiting a larger number of participants; however, using this process while ensuring the respondent’s anonymity prevented me from knowing exactly who participated in the study.

In this study, the 23 campuses were stratified based on their total enrollment size. The three different campus sizes include small, medium, and large. Small campuses have fewer than 12,000 total enrollments, medium campuses have total enrollment from 12,001 to 30,000, and large campuses are those with enrollment sizes greater than 30,000. Four campuses from each group were randomly selected. Even though the research questions did not include campus size as a factor to consider for decision-making practices, campus size was important to the study, as it provided additional insight on how the different institutions function.

The survey instruments were divided into four sections. The first section assessed the perception about their campus characteristics. The next section assessed how they perceive the leadership characteristics on their campus. The third section attempted to determine their view of their campus Institutional Research Office; and lastly, a section was dedicated to gathering demographic information about their campus and college affiliation.
Limitations and Delimitations

Delimitations are situations where the researcher, for various reasons, chooses to set restrictions on the study. The delimitation to this study was the number of participating campuses. Due to time constraints to complete this study, only 12 campuses participated in this study. The control of the campus size was also another delimitation, where I identified an equal number of campuses from each of the three sizes of small, medium, and large campuses from the system and ensured the sizes are represented in the process. Another delimitation of the study was my reservation to include the top university decision makers, such as the Presidents, Vice Presidents, and College Deans in the study. The reason for this practical delimitation was to ensure a better response rate, as the university top executives are less accessible.

Other situations and circumstances may affect the data collection and analysis. Those situations that are beyond the researcher’s control, also known as limitations, include the inability to email the department chairs directly, because their emails were not easily accessible nor provided upon request from the deans. Another limitation was the concern about respondents’ honest answers. Even though the survey was conducted anonymously, the department chairs, out of fear of being identified electronically, may have responded favorably to the survey questions regarding their campus image and leadership. Another limitation was the college deans and department chairs’ time constraints for completing a survey. Even though the survey deployment time frame was a calculated effort, the study’s two population groups are among the busier administrators.

An important consideration of data use on the campuses was overlooked, hence leading to another limitation. Based on the responses received in the open-ended question, the survey did not address the campus infrastructure competencies; or whether the university information
system even has the capability for data gathering, analysis, and distribution. Another crucial limitation of the study dealt with the survey questions. Several respondents believed the questions were repetitive, or did not relate to the topic of the research, this became apparent during the analysis phase of the study. Finally, it is important to note that quantitative research is useful for describing datasets in a manageable manner and making inferences to a population. However, it cannot yield an in-depth understanding of complex situations. Therefore, this study was only able to explain a high-level relationship between HEIs’ organizational culture and the prevalence to data use for decision-making.

**Organization of the Dissertation**

This study followed the Eisner College of Education’s Doctorate Guidebook in organizing the contents. Chapter two includes an extensive literature review with focus on organizational change; the decision-making process; understanding the nature of higher education institutions, understanding data, HEI leadership’s role in fostering a culture of evidence, and finally, the role the office of institutional research typically plays in promoting this culture. Chapter three will provide details on the research methodology used to conduct the study, including the research design, research setting, research sample and data sources, instruments and procedures, data collection, data analysis, and role of the researcher. Chapter four presents the data collected and reports on the findings. Chapter five describes the findings and offers recommendations for future research. These chapters are followed by the list of references, appendixes, and other supporting documents.

**Summary**

One of the four pillars in the American Recovery and Reinvestment Act (2009) indicates that federal education officials require that data and evidence be used to make informed policy
decisions. This has led to the emergence of data-driven decision-making in educational practices across all levels from state university systems to classroom teachers. The intent of this study was to investigate a relationship between the use of data as a tool to make executive decisions and the specific organizational characteristics of public higher education institutions. These characteristics are compiled by Kezar (2001) who claims they influence organizational change in HEIs. The study is important for HEI systems because it provides an understanding of how the affiliated campuses make decisions that will enable the system to devise policies that are more aligned with this understanding. The concept of managing by learning from the past is still foreign to many organizations including HEIs. Ironically, with improved information systems and knowledge management tools that are available, one expects this concept to become vital to the decision-making process, yet, this study proves otherwise.
CHAPTER 2 - LITERATURE REVIEW

Higher Education Institutions are dependent on resources that are outside of their control. External funding dependencies, now more than ever, expect institutions, especially public higher education institutions, to be accountable. Current expenditure decision-making models in higher education institutions rely less on data (Leimer, 2012). The transformation of traditional public decision-making processes into a more systemic process that fits the complexities of the 21st Century is not a simple task (Barabba, 2011). For example, rather than weighing the quality of a program by just counting its graduates, a measure of how that program’s graduates demonstrate mastery of the knowledge and skill sets associated with that program is more critical during the decision-making process (Osborne, 2012). The decision-making process in higher education is described by Meyer (2007) as prolonged with constant tension between upholding the concept of equitability for student access and holding the demands for accountability and quality. The deep philosophical differences between administration and faculty still remain, which probably explains the drawn-out process of implementing change. There is evidence of progress in the HEI change process, such as increased trust, collegial participation in academic decision-making, and more ownership in addressing fiscal and political realities (Meyer, 2007).

When an organization fosters a data driven decision-making practice, it is really fostering a culture of evidence. Leimer (2012) claims that the enthusiasm for adopting a culture of evidence, increases among faculty and administrators a year or so before an accreditation agency arrives, but recedes when they leave. The focus of my research was to scrutinize the factors that contribute to the higher education institutions alacrity or lack of it, in adopting a culture of evidence for decision-making purposes. There were no significant empirical studies that synthesized culture of evidence to higher education institutions. One of the reasons for this gap,
perhaps, relates to a lack of understanding on the use of data for decision-making. Other reasons could be the university leadership’s attitude toward the culture of evidence or an uninvolved Institutional Research (IR) office (Leimer, 2012). Another set of variables to consider as to why culture of evidence is not as prevalent or researched as it could be in higher education institutions relates to their unique characteristics and features. This literature review draws from a variety of sources discussing HEI culture and characteristics. One of the best and most comprehensive readings on HEI characteristics is Kezar’s (2001) book entitled: *Understanding and Facilitating Organizational Change in the 21st Century: Recent Research and Conceptualizations*. Kezar illuminates the reader on understanding organizational change and HEI characteristics by gathering research conducted by several other researchers.

Consequently, with the visible gap in literature about integrating the culture of evidence into higher education institutions, the study under investigation here can be essential to this new movement in higher education. Nevertheless, before delving into the reasons as to why culture of evidence is not as prevalent in HEIs, a clearer understanding of organizational change, decision-making process, and data as evidence is fitting. Furthermore, a deeper knowledge of higher education characteristics and how they are administered is also necessary. This chapter will attempt to contextualize previous research on these topics, and provide a critical synthesis of available literature while addressing any gaps in the literature.

**What is Organizational Change?**

Before indulging on how decisions are made in higher education institutions, we first need to understand organizational change and what prompts it. In order to respond to the changing environment of higher education and improving its quality, the demand on leaders to implement institutional change has become a norm (Kezar, 2001). Whether the change leader is a
HEI President, Provost, Dean, Student Affairs Professional, or Faculty, understanding and facilitating change is a required skill. Facilitating change, eventually leads to making decision which ultimately requires management skills. Management, according to Deming (2000), is “prediction” (loc.817). Deming asserts that deciding on simple tasks like going home after work, requires predictions or certain assumptions. For instance, we assume that our automobile will run. This prediction or assumption represents a theory. Similarly, in HEI, most decisions are made based on certain set of assumptions, leading to a theory based decision making. Deming (2000) believed that without theory, no knowledge can be gained, because through the theory we gain the experience.

Kezar (2001) explains change by describing concepts that are close to, but are not exactly, concrete change. These concepts range from institutionalization, to diffusion, adaptation, innovation, and reform. She asserts that these terms are often confused with true organizational change (Kezar, 2001). Though all have some narrow connection with change, none truly define it. For instance, according to Rogers (1995), a diffusion model tends to focus on individuals rather than whole organizations, or does not change people or structures within an organization. Diffusion also tends to rely on innovations. Change does not always involve trying something new; it may entail returning to traditional values or past practices (Kezar, 2001). Institutionalization is also different from change models, as it examines only a part of the process. Now that we have a general idea on what is an organizational change, we can delve into understanding the sources of change, degrees of change, and various organizational change models.
Sources of Change

Often, organizations forget to contemplate on why they are considering change and focus mostly on what to change and how to change it. According to Kezar (2001), understanding why a change is taking place is an important piece for the initial analysis of the desired change. The two main sources of change, according to Burnes (1996) and Rajagopalan and Spreitzer (1996), are: (1) external environment, and (2) internal environment. The study discussed in this paper attempts to understand how these sources of change impact the decision-making process. More than likely, in public higher education universities that are part of a larger system, the change would be mandated by the system and can be considered an external environment change force.

Koester, Hellenbrand, and Piper (2008) define external demands for change, such as budget cuts that continually constrain resources, as: (a) mandates by the board of trustees to increase efforts to improve time to degrees as well as graduation rates; (b) commitments to reach out to underserved communities; (c) national demands for accountability and measurable student learning; (d) regional accreditation; and (e) campus violence prevention. While internal change forces can include: (a) the changes in the campus administrative team; (b) the need for overall university planning; (c) the natural fatigue that typically accompanies widely heralded initiatives; (d) the need to rethink and redirect institutional energies in regard to how we manage technology; and (e) the need to step up efforts to achieve external recognition for the university.

Whether the source of change is internal or external, the method of how change is implemented depends on how the HEI is structured. Sohail, Daud, and Rajadurai (2006) investigated the re-engineering process of a higher education institution in Malaysia. Even though the study is from a foreign university, the principles can be applied to any HEI. The study examined the HEI restructuring process and how it helped one institution fully meet its
objectives of high quality education and training. The study claims that HEIs’ structures are either: (a) leader-driven, (b) process-driven, or (c) improvement-driven. Sohail et al. (2006) assert that an improvement-driven structure is ideal for an HEI in order to attain a high level of quality; they also critically examine the restructuring process and the major gains involved. Continuous improvement would require continuous assessment, which is in accord with utilizing data to make decisions, manage change, and determine the degrees of needed change.

Degrees of Change

When change involves minor adjustments and improvements in one or a few areas of the organization, that degree of change is called first order change (Levy & Merry, 1986). First order changes maintain the organization’s core allowing the organization to carry on its present policies with current objectives. Examples of first-order change include changing a class in a department or creating a tutoring program within a college. Second-order change refers to change that transforms the entire organization, including the underlying values or mission, culture, functioning processes, and structure of the organization (Levy & Merry, 1986). Second-order changes are irreversible, cross-functional and multidimensional and are often associated with a crisis (Kezar, 2001). Contrary to Kezar’s belief, change in leadership with opposing views, may revert a second-order change, as it did for Ford Motor Company, where one CEO adopted Deming’s management methods, and consequent CEOs reversed the efforts. (Walton, 1986)

An example of second-order change is when a university converts from a quarter to semester system. A second-order change often has two forms of resistance, both from within and outside the organization. One would expect the decision-making process for this change to be more tedious because a shift in paradigm among various parts of the organization is expected,
where philosophies, beliefs, values, structures, policies, and operations that characterize an organization will be touched. The study investigated here, addressed these types of change and the decision-making process and how relationships impact these types of change. The decision-making process in second-order changes will have to focus on holism, rather than parts and systems.

Change can also be classified as revolutionary or evolutionary (Gersick, 1991; Levy & Merry, 1986). Revolutionary change relates to the second-order change and usually occurs suddenly, with drastic changes; in contrast, evolutionary changes, are slow and transformation happens over time. Evolutionary change requires more decision-making than revolutionary change, as such HEIs are apt to evolutionary change. Change can be planned or unplanned. Planned change is deliberate requiring a careful decision-making process. In higher education, unplanned change normally stems from some form of catastrophe (i.e., the 2007 mass shooting at Virginia Tech campus or the 1994 Northridge earthquake). Change has also been classified as proactive (happening before a crisis) or reactive (happening after a crisis) (Kezar, 2001).

**Change Models**

One of the unique characteristics of higher education institutions is the ability to ignore its environment without going out of business. The competitive edge that is visible in other organizations is very limited at HEIs. One of the change models associated with this characteristic, according to Kezar (2001), is a political or dialectical change model. Dialectical change models refer to theories that have been publicized for their sophistication in illustrating complexity and in showing the regressive phases of change, ambiguity, struggle, and sometimes irrationality (Kezar, 2001).
Furthermore, the dialectical change model that is more prevalent in HEIs adopts the Hegelian-Marxian perspective on when a pattern, value, ideal, or norm in an organization always has a polar opposite. For instance, the concept of communitarianism with the opposing value of individualism is quite common in HEIs (Kezar, 2001). What is interesting about dialectical change models, are the interconnections of the polar opposites and how their relationships lead to change. Wheatley (2006) describes how understanding the system rather than focusing on its parts and players brings the awareness of how living systems emerge and change. Ultimately, the clash of the opposing views leads to some form of change, whether evolutionary or revolutionary. The need to change is eminent, yet deciding what, how, and when to change and what really impacts these decisions was perhaps the main purpose of this study.

A study by Ness and Tandberg (2013) provides valuable insight on the dialectical change model and its impact on decision-making. Their exploratory study provides an analysis of the 50 states and their spending on higher education. The study claims that there are two types of spending, general appropriations and capital. The data from National Association of State Budget Officers from 1988 to 2004 is the dependent variable, while several political variables, such as the higher education interest group ratio, serve as independent variables. Ness and Tandberg (2013) concluded that political characteristics, like interest group activity, organizational structure, and formal powers, determine how much higher education systems receive for each spending category. This highlights relationships and interdependence among political systems such as higher education institutions that is in accord with how Wheatley (2006) says, “We participate in a world of exquisite interconnectedness” (p. 158). Since change entails interconnectedness, perhaps a better understanding of the whole systems is the roadmap to understanding change.
An Alternative View on Change

**Self-organizing systems.** In her book, *Leadership and the New Science*, Wheatley (2006) introduces the concept of self-organizing systems. The idea is similar to Kezar’s (2001) evolutionary change model where a HEI’s thermostat redirects the entity in order to respond to certain needs. Ironically, both concepts herald some sort of faith in the idea that matters will take care of themselves, and change will happen organically to self-preserve. Wheatley (2006), however, adds the need for a clear organizational intention and the freedom to act toward that intention. Organizational intention, as described by Wheatley (2006), is more than a strategic plan. The organizational intention refers to the vision and mission of the institution, but infused in every member of the organization.

Another necessity in managing change in organizations is the ability to move swiftly enough to meet the needs of the environment and to respond to the frequent and unplanned changes coming forth with dexterity (Wheatley, 2006). In the midst of an unending stream of information, selecting what to pay attention to or which lens to use to view the world, determines the decision-making process. The process of self-reference is a tool to determine whether an option is feasible for an organization. In other words, when initiating change, it is important to understand where an organization is and where it wants to go. Self-reference explains why organizations are motivated to change.

**Relationships.** “Everything comes into form because of relationship” (Wheatley, 2006, p. 145). Information, people, events, ideas, life, even reality are created through participation in relationships. Leaders choose what to notice, what to relate to, and what to ignore. It is through these chosen relationships that change comes about (Wheatley, 2006). Again, this view is in accord with one of the 13 characteristics of HEIs as compiled by Kezar (2001). The HEIs’
interdependent characteristic defines them as networking webs and much can be learned from this interdependence and how decisions are made in conjunction with their multiple power and authority nature.

With a greater familiarity about organizational change, we now can delve into understanding the decision-making process in organizations. Ultimately, understanding how higher education leaders make decisions and which factors impact this process was the purpose of this present study. The decision process itself as well as the decision-maker’s capabilities, and how these two phenomena interact is discussed in the next section.

**Decision-making**

What leaders know with certainty when making a decision is dependent on their perception. Addressing perception and reality, has been a historic debate and even discussed in Plato’s *Republic* (2004). A discourse between Socrates and others in their attempt to envision the perfect political state turns into a discussion of perception. The knowledge humans gain is compared to the shadows and reflections seen on the cave walls. People and objects passing outside the cave, depending on the time of the day and how light shines through may have different appearances; those sitting inside of the cave would be naïve to interpret shadows as the real world. As Socrates says, “The forms which these people draw or make are converted by them into images. But they are really seeking to behold the things themselves, which can only be seen with the eye of the mind” (Plato & Reeve, 2004, p. 391). Perception, or as Barabba (2011) calls it, “the viewing lens” plays a major role on how data and information is used or not used for decision-making process (p. 148).

The need for an interactive decision-making process to address complex and dynamic change is not new, however, Barabba (2011) in his book: *The Decision Loom* examines this
interactive process. He further defines the capabilities that are required for an interactive
decision-making process to be implemented in any public or private organization. Moreover, he
argues that to appreciate the interactive decision making process, we first need to understand the
dimensions of the decision-making process (2011).

**Dimensions of the Decision-making Process**

There are three dimensions to the decision-making process (Barabba, 2011). Figure 2.1
illustrates how the three dimensions interrelate to produce an interactive process. The initial
dimension is logical and analytical. The second dimension is dialogue and collaboration, and the
third addresses imagination and creativity. Similarly, Wheatley (2006) identifies three elements
involved in system change, which include: (a) information, (b) relationships, and (c) identity.
Information is the logical and analytic element of the decision-making process; while dialogue
and collaboration refers to the relationships, and identity to the imagination and creativity. The
imagination and creativity may also be referred to as intuition.

Figure 2.1

*The three elements of Decision-making (Barabba, 2011)*
**Logical and analytical.** In the digital age in which we live, we are accustomed to using information and analytics quickly as a tool for making decisions. We have been taught that to better understand a problem, we need more information (Barabba, 2011). Fortunately, there is no shortage of information in the information age; however, we are sometimes faced with a shortage of credible information. Some factors impacting the information credibility include:

*The age of the information.* The date the information was published or the data was extracted can make the information credibility an issue, since many factors may have changed since the time of the publication. Having real-time information is essential to decision-making.

*How the data was extracted?* The credibility concern here is whether the right question was posed when extracting the information, or was the data skewed to make the information more favorable to the decision maker.

*Context.* Whether the information provided relates to the whole system or part of a system can cause credibility issues. Understanding the purpose, proportion, function, and interactions of the parts compared to the whole is also a credibility concern. A famous Sufi quote states, “…you think because you understand *one* you must understand *two*, because one and one makes two. But you must also understand *and*” (Wheatley, 2006, loc. 382).

To make decisions simply based on *information* is no longer feasible; there is a need for *credible* information. Subsequently, credible information requires more resources, more sophisticated techniques, and more advanced technology (Barabba, 2011). Making good decisions is no longer just about using data, but measures that are dealing with reliable and relevant approaches to understanding the problem the decision is wanting to resolve (Barabba, 2011).
**Dialogue and collaboration.** The second dimension in decision-making is dialogue/collaboration. Decision-making in virtually any organization is a collaborative process. Sharing of information from various perspectives is a start (Barabba, 2011). As Wheatley (2006) says, “Nothing exists independent of its relationships” (p. 69).

**Imagination and creativity.** The third dimension of decision-making is imagination/creativity. Using imagination and creativity with a touch of intuition all relate how leaders identify with themselves. Those with diverse experiences and viewpoints can be quite intuitive in generating the best possible solutions to solve important matters (Barabba, 2011). Those are leaders that “draw from intuition, fantasy, inner imagery, inspiration and everything else that is creative about the human psyche” (Barabba, 2011, p. 233).

**Interactive Decision-making**

With a better knowledge about the dimensions of decision-making, we can now attempt to understand Barabba’s (2011) interactive decision-making model, also referred to as the decision loom, which combines capabilities with the decision process in order to realize the best results:

**Enterprise mindset.** This capability is the prerequisite to successfully achieving the other three capabilities. The idea is for the decision maker to be open-minded and willing to accept necessary changes. Many times, in higher education institutions, the mindset of the enterprise is so fixed on what worked in the past that it is difficult to even understand a (new) systemic design.

**Thinking and acting holistically.** Holistic thinking means that logic and analysis are not the dominant modes of thought but are only used when appropriate (Barabba, 2011). The linear thinking by some leaders in HEIs prevents this approach from emerging naturally. Similar to
Senge’s (2006) system thinking, the key idea in this capability is for the decision maker to understand that separating out and then optimizing different functions usually reduces the effectiveness of the whole system.

**Adaptability.** Adapting to the changing conditions is the main idea of this capability. The reason this capability may not apply to HEIs, is the speed at which higher education institutions, especially, public HEIs, must adapt to change. The shared governance and the dialectical nature of HEIs, per Kezar (2001), may be the reason for this limitation.

**Combining methods.** This capability relates to the ability to use all dimensions of decision-making discussed above. Higher education leaders based on their governance structure have to use the relationship dimension. Even though the silo mentality has been the prevailing paradigm in the past, recent accreditation requirements require HEIs to work across divisions and adhere more to analytics and logic dimension (Leimer, 2012).

**Critical Assumptions**

Having all the capabilities discussed above, does not guarantee impeccable decisions. Barabba (2011) asserts the assumptions made during the decision-making process, in addition to attention to previous mistakes, can enhance the probability of a better decision. According to Barabba (2011), one of the key steps to making a decision, is to ensure all critical assumptions are shared and transparent. He suggests addressing important questions such as who are the stakeholders and how are they impacted is very important on the outcome of decisions made. In other words, who and what will be impacted by the decision should be of concern. The reason for identifying critical assumptions, relates to leaving a trail for the logic in making certain decisions. Additionally, identifying all assumptions will provide the decision maker the ability to model the various outcomes based on different assumptions.
Lessons Learned

A key step in decision-making, according to Barabba (2011), is learning from past decisions. The process of recording decisions, their critical assumptions, and results is described by Pourdehnad (2000) as a black box, in the same way used in airplanes. The process includes three components that go into any enterprise decision, regardless of how the decision is made. They include: (a) decision-makers, who are the people who use the data bank to make decisions; (b) organization, who receive direction from the decision makers and uses and returns information to the data bank while implementing decisions; and (c) the decision support and data bank, which contains the organization’s strategic decisions. The function of this data bank is to be used as a tool for future reference and allow future decision makers to learn from them (Barabba, 2011).

As noted above, there is certainly no lack of knowledge or technology on how to use information to substantiate decisions, yet 68% of college presidents acknowledged in a 2011 survey that they do not use data to substantiate their decisions (Leimer, 2012). Perhaps Machiavelli’s (2006) assumption in *The Prince* was valid about men. He asserted that men, like nature, are subject to immutable laws and are always the same and are driven by some form of passion the leads them to same decisions, situations and end results. From this assumption, he draws two conclusions, that leaders can plan the course of action by contemplating upon past historical events, and apply lessons learned to the current situation. Similarly, Greenleaf (2008) asserts that an effective leader must be a “historian, contemporary analyst, and prophet at the same time.” (p. 26).

Higher education institutions in the United States have a duty to demonstrate effective use of resources while providing high quality education. Consequently, to make effective
decisions based on institutional data and analysis has been their due diligence in response to this demand (Osborn, 2012). Perhaps HEIs in the United States need to go through the same significant structural change that New Zealand universities have undergone. In 2000, one of New Zealand’s largest universities redirected resources and funding that resulted in consequences affecting staff, which led to legal ramifications requiring major review of academic policy making (Meyer, 2007). Thus, the structures and decision processes in HEIs in New Zealand, as in the United States, indicated an ongoing tension between conventional academic processes and governance versus managerial approaches influenced by the business sector models. Based on a case study on this topic, preliminary evidence suggests “limited but successful” outcomes that promise both shared academic governance as well as effective management (Meyer, 2007, p. 1).

Effective management, in the private and non-academic sector, tends to substantiate decisions for various reasons, one of which is the lower “error tolerance” in the business sector (Moynihan & Landuyt, 2009, p. 14). The second reason is lack of resources available to conduct sophisticated data analysis. Lastly simply deals with not understanding how to utilize data and converting it into wisdom. Whether HEIs have high tolerance for error in their leadership, or the resources are simply not available to regurgitate effective information from raw data; understanding data is certainly one of the ways to promote the culture of evidence.

Data

How data is transformed into wisdom to make effective decisions has been theorized and addressed by various authors. The commonality among these theories is that data by itself does not provide the knowledge necessary to make effective decisions. Even though the methodology and techniques of this transformation have grown and advanced, there seems to be a stumble before data could transform into knowledge. The present study unpacks what causes that
floundering in higher education institutions. A theory by Choo (2006) describes this transformation process in four steps and is referred to as the knowledge development process. Barabba (2011) on the other hand provides additional factors impacting this transformation and how knowledge leads to wisdom and what impacts how we view data.

**Knowledge Development**

The four steps in knowledge development described by Choo (2006) are: (a) signal, an external threat that an organization or decision maker recognizes; (b) data, the effort of collecting information about the threat and how it impacts the institution; (c) information, an understanding or a common meaning of the threat and/or proposed solutions; and (d) knowledge, a common meaning incorporated into the culture of the institution and action items are devised based on that knowledge. In HEIs, data collection may include retention studies, studies of faculty workload issues, satisfaction surveys, student involvement surveys, faculty surveys, and student outcome studies (Osborn, 2012). However, the data collected is overwhelming and inadequate and HEIs are learning that effectiveness is more than data collection, storage, and retrieval (Osborn, 2012). Effective decision-making is more than collecting, storing, and retrieving data, but more about understanding how to use the data, and even understanding the process that transforms data into wisdom.

**Data to Wisdom**

Figure 2.2 illustrates how Barabba (2011) envisions data transforming into wisdom. In this realistic illustration, data first is transformed into information depending on the viewing lens. A viewing lens, per Barabba (2011), is the tool that discriminates on which data is retained and which is ignored. The compilation of information leads to intelligence, which in turn, depending on the question or decision being addressed, leads to the wisdom to make a decision or a policy.
“The bent and rejected arrows between the elements illustrate the impact of a possible ‘distorted’
viewing lens used by the individuals involved in collecting and processing data into information,
intelligence, knowledge and understanding, and eventually into a wise decision.” (Barabba,
2011, p. 147) In other words, the arrows recognize the viewer’s predisposition on a topic, and
directly affect how the decision maker sees, accepts, or rejects ideas at each level.

Data as Evidence

**Evidence based management.** Evidence based management (EBM) is fundamentally
designed to increase transparency in a change process (Potworowski & Green, 2012). Ironically,
in public higher education institutions, where accountability of the decision process is a matter of
compliance, EBM is not widespread (Leimer, 2012). Protworowski and Green (2012) claim that
culture of the organization influences the adoption of EBM and could alter what information and
suggestions are provided to decision makers. Data in this study refers to any information that
may influence the decision-making process. Data can belong to any of the three decision-making
dimensions discussed in the earlier section. Analytical data refers to quantitative and statistically
analyzed data and may include the lessons learned data bank; whereas, collaborative data is more
qualitative data gathered from dialogue with subject matter experts or stakeholders. Finally, the
intuitive data are data from different intangible sources, including experiences or a leader’s
vision. All types of data can be used to substantiate a decision.
Data variance. Even though data can be categorized in many ways, understanding it and why it varies is probably more important than collecting and analyzing it. Deming’s system of thought, the System of Profound Knowledge, consists of four interrelated parts. (a) appreciation for system, (b) knowledge of variation, (c) theory of knowledge, and (d) psychology (Deming, 1990). Data refers to the range and causes of variation in the performance of a system, and use of statistical sampling in measurements. Deming believed in an attempt to improve processes, two mistakes can occur; one is to treat a common cause for variance in quality as though it were a special cause, or treat a special cause as though it were a common cause for the variance in quality. An example of special cause mistaken for common cause would be assuming the off-the-
chart low grade of five students in a math class may come across as a common cause, but after further research, by looking at the grades for all students in the system, it can be discovered the grades are similar for all students with parallel socioeconomic backgrounds. Hence, it can be concluded that this is a special cause. This type of error in analyzing data is common in every organization and HEIs are not exclusive.

Deming’s (2000) Theory of Knowledge argues that management in any form is prediction, and any statement, “if it conveys knowledge, predicts a future outcome, with risk of being wrong” (loc. 817). He believed that any rational prediction requires theory. Most theories are build based on an assumption. Consequently, the theory is tested, observed, and systemically revised. The original theory is then improved and knowledge is built. His depicts this abstract concept by his barnyard rooster example (loc. 821):

The barnyard rooster Chanticleer had a theory. He crowed every morning, putting forth all his energy, flapped his wings. The sun came up. The connection was clear: His crowing caused the sun to come up. There was no question about his importance. There came a snag. He forgot one morning to crow. The sun came up anyhow. he saw his theory in need of revision. Without his theory, he would have had nothing to revise, nothing to learn.

Whether a decision process in HEI is theory-driven as reasoned by Deming (2000) or has no systemic bases and arbitrary, the HEIs have the need to demonstrate effectiveness in order to remain accredited or receive state funding. Given the complexity within educational systems, there is a definite need to develop and implement a common data-based decision-making process. According to Cramer (2014), the process should be based on mutually agreed-upon standards among all stakeholders, with defined goals and competencies. Replacing anecdotal
cultures with cultures of evidence would require appropriate planning and asking the essential questions as to what feature of the HEI is a contributor to this second-degree change (Kezar, 2001). Thus, understanding the nature of the higher education institutions will allow us to identify these factors.

**Nature of Higher Education**

Higher education institutions are unique in nature. Their goal(s), governance, culture, and values are different from any other industry. They have certain organizational characteristics that determine how decisions are made. Kezar (2001) compiled 13 of these unique characteristics that will be discussed in this section. Which characteristic(s) and to what extent they impact the use of data in decision-making, was the focus of this present study, making Kezar’s typology central to the investigation. Additionally, Leimer (2012) asserts there are two major necessary elements missing in “sparking and sustaining” evidence-based decision-making; the leadership’s attitude, and the involvement level of the office of institutional research (IR). This section will also explore research on the role of leadership and the level of involvement IR office in HEIs. Since the accreditation agencies are major promoters for using data in decision-making in HEIs, the last part of this section is dedicated to studies related to accreditation agencies. Ironically, colleges and universities are filled with people who know how to use data, yet the resistance to accountability demands has always been a concern (Leimer, 2012).

**Organizational Characteristics**

Organizational characteristics are aspects of an organization that relate to its performance, which may include its culture, goals, structure, and governance. In the uniqueness of educational industry and the current urgent need for change, it is important to understand the organizational characteristics of HEIs (Kezar, 2001). Understanding the organizational
characteristics before strategizing change methodologies is not unique to higher education, as other professions and organizations are developing distinct change models to fit their contexts (Kezar, 2001).

This section will provide the 13 distinctive characteristics compiled and synthesized by Kezar (2001) for the purposes of understanding and facilitating change in HEIs. Her work was the framework of this study, with the intent to determine whether there is a relationship between any of the 13 characteristics and the inclination to use data among leaders of this university system. The findings indicated that a correlation is indeed present and three out of 13 characteristics were influential on use of data, however not for the purpose of decision making, but rather to satisfy a reporting need. The details of these three characteristics are discussed further in chapters four and five; however, in this section we will discuss all 13 characteristics: (1) interdependent organization, (2) independent of environment, (3) unique culture of academy, (4) instructional status, (5) value-driven, (6) multiple power and authority, (7) loosely coupled, (8) organized anarchical decision structure, (9) professional and administrative values, (10) shared governance, (11) employee commitment, (12) goal ambiguity, and (13) image and success (Kezar, 2001).

**Interdependent organizations.** As mentioned earlier, higher education institutions rely on outside sources to survive. They do not operate in a vacuum and are impacted by decisions made by other organizations internally and externally whether in local, regional, or national levels. Public universities, especially, tend to have boards who normally must respond to multiple regulations and constraints placed on by the political history and structure of the state (Lombardi, 2013). The mixed messages HEIs receive from these multiple entities influence what to change and how to change it (Kezar, 2001). The interdependent nature of HEIs is one of the
three characteristics that proved to be influential in data use in this study. Hence, the lack of autonomy and the inability to set a course of action independent of other entities (Alpert, 1991) is perhaps the best way to describe this characteristic. Lombardi (2013) asserts that “universities and their boards tend to have somewhat more autonomy from the intervention of state legislatures and governors than universities that exist by virtue of a state law, but the independence is often more a function of political climate than formal authority” (p. 162).

**Independent of the environment.** Historically HEIs have had lesser degree of environmental independence. Unlike private HEIs, who experience greater vulnerability to market forces, public institutions are more impacted by state legislatures. Currently, however, there is greater pressure for HEIs to meet external demands and get involved in solving social issues, as well as assist local and state economic development (Kezar, 2000a). Historical influences, however, linger and a culture of autonomy still exists in HEIs (Kezar, 2001). If we compare HEIs to businesses, it is clear that businesses are more independent in decision-making, yet are bound to a higher dynamism called the market. While HEIs enjoy the freedom from market forces, they are bound by their interdependence to all levels of entities. Additionally, Berdhal (1991) asserts that HEIs vary in degree of which they are insulated from market, economics, social, or political forces. For instance, since the 1960s, attending college has increased in every recession, as it did during the recent great recession (Stanford University News, 2015).

**Academic culture.** This unique characteristic describes the “political yet consensus-oriented” (Kezar, 2001, p. 66) nature of HEIs. The combination of collegium and bureaucratic values are clearly present which leads to the existence of a political and yet an unclear structure (Kezar, 2001). Interestingly, the degree of each aspect (bureaucratic and collegium) varies for
each institutional type. Bergquist (1992) reports that liberal arts colleges tend to be more collegial, while community colleges tend to be more bureaucratic. The trend, however, suggests that a more entrepreneurial and market driven HEI may be emerging (Kezar, 2000a).

**Institutional status.** The word institution according to Webster’s dictionary (2016) refers to “an established organization or corporation (as a bank or university) especially of a public character”. Similarly, Kezar (2001) refers to universities as organizations that serve long-standing missions and feed ongoing societal needs. Godemann, Bebbington, Herzig, and Moon (2014) state that HEIs exist for a specific purpose, including (a) teaching and learning, (b) research, and (c) knowledge exchange. This HEI characteristic is closely related to the independence from the environment characteristic mentioned above, as HEIs, like hospitals, banks, and law firms, have a societal mission and are needed. Recent development, however, indicates that legislatures and the public are questioning whether HEIs should remain the traditional institution or follow the for-profit model (Kezar, 2001). Nonetheless, my research indicates the need to demonstrate the societal mission is being accomplished outweighs the actual delivery of the goal.

**Values-driven.** HEIs have unique belief systems that guide and shape their culture and structure. Examples of these belief systems include the importance of research, integrity in research, and importance of shared access to higher education. While these examples are shared values across the universities, Clark (1983a) asserts that each disciplinary culture also has its own unique distinctive beliefs and values. Kezar (2001), stresses that the recent trends of individuals from diverse backgrounds joining the administration and faculty ranks bring with them different values within the institutions leading to slower and more difficult change process (Kezar, 2001).
Multiple power and authority structure. Power is defined as “the ability to influence or exercise control over others” (Kezar, 2001, p. 68) and is one of the three characteristics identified in this study as influential in data use in HEIs. What makes the HEI power structure unique is its reliance on referent and expert powers rather than coercive, reward, or legitimate powers. Yet the administration’s power in general and partially is masked or secret, because in a collegial environment, it is socially unacceptable to exert power (Birnbaum, 1991a). “It may take months for a new employee to determine who possesses power on campus” (Kezar, 2001, p. 69). This setup is already complicated between faculty and administration, then with the addition of the trustees, the state, and the “occasional charismatic individual” to the pot, and change and decision-making will take months if not years (Kezar, 2001, p. 69).

Loosely coupled. Loosely coupled refers to a cognitive response, where connections, networking, diffusion, imitation, and social comparison have no meaning. In loosely coupled organizations, “adaptability refers to changes that meet individual needs, while adaptation is change that is in response to an external need” (Kezar, 2001, p. 70). Similarly, Duderstadt (2007) argues, that although this characteristic of HEIs may ease adaptation to the changing environment, it can also hinder the university’s agility to respond to the broader mission requirements. This lack of synergy among an HEI’s internal organizations is perhaps one of the main reasons that transformational change is slow and prolonged.

Organized anarchical. An organization’s decision-making process is labeled as organized anarchy when it has ambiguous goals, unclear technology, fluid participation, and is unpredictable and nonlinear (Birnbaum, 1991a). HEIs are organized anarchical organizations, per Kezar (2001), because they do not allow trustees, legislatures, and presidents to gain more control over policies. Clark (1983a) asserts that organized anarchical decision making is
characterized by ambiguity. The ambiguity stems from the lack of formal authority due to their interdependent nature, loosely coupled structure and multiple power and authority (Kezar, 2001).

**Professional and administrative values.** There are two main employment groups in HEIs with two different values systems. One is the administration which relies on hierarchy, structure, control, and coordinated efforts. The administrative group relies on power and influence to achieve the university’s goals and mission (Birnbaum, 1991a). The other group is the professionals whose authority is based on knowledge and values collegiality, dialogue, and shared power (Sporn, 1999). Therefore, any initiation of change, is impacted by where each group’s loyalty falls. It is the growing conflict between administrators and the professionals, which paves the way for a dialectical change model (Kezar, 2001).

**Shared governance system.** All organizations have governance. HEIs have decentralized decision-making through shared governance processes. This is the third characteristic identified as influential on data use. Even though the trustees and boards have authority over certain areas of HEIs, such as finance, major functions and decisions of HEIs are shared between faculty and administrators. According to Kezar (2001) this is the feature that most slows down change at higher education institutions.

Governance means different things to each stakeholder (Lombardi, 2013). For instance, to the faculty, governance means faculty involvement in decision making for various aspects of university life, such as academic issues of curriculum, hiring, promotions, and budgetary allocations. While to the students, governance may mean the authorities that regulate their life. Governance in public universities such as the one in this study, also means boards of regents, trustees, governors, education commissioners, and legislatures. To administrative staff, governance is the organization of the reporting relationships and lines of authority. This complex
structure of HEI governance and sorting out all the perceived authorities is perhaps a main reason why decision making is not an easy task.

**Employee commitment.** One of the overlooked features of HEIs is the low turnover of employees, due to the tenured system. It is not clear whether this characteristic improves or hinders the change process (Kezar, 2001). Whicker (1997) asserts that tenure diminishes the programmatic dexterity of HEIs. For instance, granting tenure tends to limit the department Chair’s flexibility to move faculty from an unsubscribed class or topic to an over-subscribed one. This type of constraint impacts the program and the university. Perhaps this is the reason that the hiring practices at many colleges and universities have been recently altered to include more adjunct faculty and consultant hires.

**Goal ambiguity.** Even though recent attempts to clarify and simplify HEIs’ goals and outcomes, the anarchical structure of HEIs, and their multifaceted goals that are complex and hard to measure, is definitely a hindrance in the change process (Kezar, 2001). There has always been a push from legislators to better clarify and simplify the goals and outcomes of HEIs, yet the continuous attempts to quantify the goals have been unsuccessful (Banta & And, 1996). Setting goals is easy, but if there are no measures to assess the success of the goal, then the goal is inoperable. As Barabba (2011) mentioned above, an interactive decision-making process requires a clear organization goal, which is often lacking in HEIs.

**Image and success.** HEIs place much emphasis on managing their image, success, and prestige. Measuring success has always been problematic and may relate to identity; hence, organizational change may be closely related to identity modification (Kezar, 2001). This characteristic may be a deterrent factor in low prevalence in use of data for decision-making. Lombardi (2013) asserts that “…many academics prefer to speak about quality in the abstract
rather than measure it explicitly, either because they worry that their self-image may not match a
data-driven evaluation of quality or because they do not believe in the performance-based
budgeting process itself and judge that the best attack against it is to deny that it can support
quality improvement.” (p. 119).

Leadership

With a clearer view of higher education institutions’ organizational characteristics, we are
ready to delve into understanding the role of the organization’s leadership in embracing research
based decision making. Adopting a culture of evidence is “making sense of and strategically
applying and communicating data and findings to diverse audiences in ways that prompt
organizational learning and stimulate people’s desire to know more and then to act on the
information” (Leimer, 2012, p. 46). There seems to be a positive relationship between leadership
and organizational culture. Positive and meaningful relation between transformational leadership
and learning organizational culture represent the role of leaders in creating a learning culture that
supports change and innovation (Schein, 2006).

Developing a culture of evidence takes time and sustained effort in multiple levels of the
organization. However, Leimer (2012) asserts, someone needs to take the lead, someone who can
advocate for, and maintain focus on, this way of thinking and practice. On most campuses, no
position or office is assigned to this role without the leadership’s directive. Challenges, such as
accountability to the public, managing cost, expanding technology, and measuring student
outcomes, requires more participatory forms of leadership (Kezar, 1996). Even with the
existence of an active IR office or other operational unit that may convert data into useful
information around which leadership can make decisions, without the existence of a visionary
leader who promotes this culture, the shift in paradigm in HEIs will likely be impossible. That is
why Leimer (2012) places so much emphasis in the role of HEIs’ leadership in promoting a culture of evidence.

**Institutional Research Offices**

Institutional research offices may play an important role in promoting a culture of evidence. However, recent empirical data indicated that 90 percent of college presidents said they wanted their IR offices to be proactive, but only half said that they were fulfilling this expectation (Leimer, 2012). Even though past research indicated most colleges and universities’ IR offices have never explicitly became involved in a change of culture, more recent research indicates that HEIs are increasingly relying on IR offices to document performance by providing data to external audiences. In fact, much of the funding available to HEIs today comes with some form of reporting provided by IR offices (Leimer, 2012). In addition, accrediting agencies have shifted their orientation toward data-driven continuous improvement. College administrators are challenged with motivating faculty and staff to engage in institutional transformation by contributing to and supporting institutional research and assessment in their daily practice (Leimer, 2012).

Quality movement was originally rooted in business and industry and has slowly become an emerging trend in higher education institutions. The Malcolm Baldrige National Quality Award, for example, is a federally sponsored quality initiative that provides criteria to educational institutions that can be used to determine the quality of their institutions (NIST, 2016). Colleges adopting this approach use Baldrige criteria and strategies to demonstrate excellence and measure quality. Incorporating these or similar criteria and strategies may be an effective way for HEIs to start building a culture of evidence in their respective institutions. The Baldrige criteria are not new and have been in the making for 30 years (Oburn, 2005). These
criteria provide an analytical framework consisting of a set of questions about critical aspects of an institution’s management and performance. These criteria can clarify the role of IR, specifically the part IR offices play in how institutions organize themselves to create a culture for evidence-based decision-making and improvement (Oburn, 2005)

**Accreditation Agencies**

The need to identify quality standards, in order to assist consumers like prospective students and parents in deciding which HEI to attend has increased with the growth in the number of public, private, and specialized colleges and universities. This has led to the creation of entities like accreditation agencies to set these quality standards. The first group of regional accreditation agencies was established in 1952 (U.S. Department of Education, 2015). There are now 15 regional and national accrediting agencies that are recognized by the U.S. Department of Education. The accreditation agency relating to the university system in this study is Western Association of Schools and Colleges, Senior Colleges and Universities (WASC) and was also among the first agencies to be established in 1952.

American regional accreditation serves two basic functions: quality assurance and quality improvement (Brittingham, O’Brien, & Alig, 2008). The public function of WASC is quality assurance, and it aims at accreditation signals to prospective students, parents, employers, and others that the institution meets fundamental standards of quality (Brittingham et al., 2008). Conversely, the private function of WASC is quality improvement. The idea is to provide institutions with a useful engine to foster improvement (Brittingham et al., 2008). The traditional role of institutional research in an institution has mostly been to prepare for accreditation. This traditional role, which is mostly aligned with the quality assurance function of accreditation, is slowly transforming to a more on-going quality improvement function of accreditation. The
distinction between quality improvement and quality assurance is best described by Deming’s (2000) intrinsic versus extrinsic motivation theory. Quality improvement relates to intrinsic motivation of a person or organization, and quality assurance relates to extrinsic motivation impacting the person or the organization. Similarly, Bellows (2015) compares two new concepts about excellence: compliance excellence and contextual excellence. One significant distinction between the two is the completion of a task at hand. In quality assurance, like compliance excellence, the goal is to meet some criteria. Contrary to quality improvement and contextual excellence, the goal is how the criteria is met. As this research, will reveal in chapter four; this university system is prevailing in compliance excellence.

Summary

One of the visions of the California State University, Northridge Doctoral Program in Educational Leadership is to ensure its scholars learn to lead through: (a) collaboration, (b) action research, (c) cultural proficiency, and (d) systemic reform (CSUN, 2013). Planning systemic reform and managing the change process in a higher education setting is perhaps the main motive in conducting this study. According to the Doctoral Handbook (2013), for profound change to take place, “leaders need to understand, navigate, respond to, and influence the larger policy environment and the political, social, economic, legal, and cultural context of education” (p. 2). Hence, to bring about systemic change in any organization, especially to public higher education institutions, one must also understand organizational change, the decision-making process, data, and the unique nature of HEIs. Moreover, culture of evidence is important in systemic change, because if decisions for change are made based on only one of the three dimensions of interactive decision-making theory proposed by Barabba (2011) (dialogue/collaboration, imagination/creativity and logical/analytical), it could lead to ineffective
policies. Placing context on previous research on culture of evidence and higher education institutions has not been an easy task, as the number of empirical studies that synthesize the two concepts was minimal. Nevertheless, using Kezar’s work on HEI organizational characteristics as the framework to understanding change, decision-making, and data, has brought us closer to closing the loop on this topic. In the next three chapters, we will discuss the methodology, explore the findings from the data gathered and delve into defining the anatomy of decision making in higher education institutions. This knowledge was gained by identifying the three characteristics impacting data use in HEIs including: (a) shared governance, (b) interdependent nature, and (c) multiple power and authority.
CHAPTER 3 - METHODOLOGY

The idea of exploring culture of evidence at higher education institutions was in response to a 2011 Inside Higher Education survey, which revealed 68% of college presidents admitted their institutions are not particularly strong at using data for making managerial and operational decisions (Leimer, 2012). At the same time, per the American Association of Community Colleges (AACC) (2012), higher education institutions are “moving from a culture of anecdote to a culture of evidence” (p. 14). Leimer (2012) even asserts that the focus for data collection and analysis tends to rise when there is an external demand for them, such as accreditation, but recent studies indicate that the administrators and faculty are becoming more engaged in sustaining this practice, even after the accreditation process ends.

Through a correlational design, this study attempted to investigate the relationships between the university decision makers’ perceived organizational characteristics and use of data as evidence for decision-making on their campus. The focus was more on examining the association or relation of the universities’ unique characteristics and their perception on the culture of evidence for decision making on their campus. Creswell (2005) defines correlational design as follows:

Correlational designs are procedures in quantitative research in which investigators measure the degree of association (or relation) between two or more variables using the statistical procedure of correlational analysis. This degree of association, expressed as a number, indicates where the two variables are related or whether one can predict another (p. 21).

In the design, multiple regression modeling was used to explain the variation in the dependent variable (use of data in HEI as perceived by decision makers) by each predictor variable as well as combined effect of both predictor variables. By understanding the impact
each predictor had on the dependent variable, future scores can be predicted for the dependent variable. Correlational design was appropriate for this study because it provided greater flexibility to explore relationships between and among various factors derived from Kezar’s (2001) 13 characteristics and the use of data.

The study hypothesized that HEIs’ unique characteristics, as described by Kezar (2001), have a relationship with the use of data for decision-making. Even though the decision makers in HEIs could include a wide range of roles within a university, for the purposes of this study, it refers to faculty who have administrative roles and can allocate resources, such as college deans or department chairs. The study addressed the following research questions:

1. Do HEI unique characteristics have an impact on using data for decision-making?
2. If yes, then which of the characteristics are most influential on using data for decision-making?

The dependent variable in this study was the perceived use or inclination to use data as evidence for decision-making. The independent variables were the HEIs’ organizational characteristics, as described in Table 3.1. A survey instrument was used to collect both the dependent and independent variables. The four main sections in this chapter include: (a) research setting or context, (b) procedures, (c) data collection, and (d) data analysis. The research setting section will describe and justify selection of the research setting. The procedures section provides the details about the survey instrument, including the survey development process, how the reliability and validity of the instrument was assessed, and the pilot process. The data collection section is a step-by-step description of how the survey was administered and the collected data was managed. Lastly, the data analysis section describes and justifies the statistical methods that were used and how the hypothesis pairs were tested.
Research Setting

The focus of this study was 12 universities within a large university system with 23 campuses, almost 474,600 students, and 49,000 faculty and staff. The enrollment level at these campuses ranged from 7,102 to 41,548. The university system’s workforce has a diverse ethnic and educational background; hence, the study’s population had a diverse ethnic and educational background. The rationale to select this system as the setting for this study was twofold. As a public educational system, the information needed to conduct a study is easily accessible; and as this system is one of the largest university systems in the country; the findings in this study could have national impact.

Research Sample and Data Sources

Target population or sampling frame is defined as “a group of individuals...with some common defining characteristics that the researcher can identify and study” (Creswell, 2005, p. 142). The target population was the college deans and department chairs from 12 out of the 23 campuses. The average head count for the college deans was 6.5 per campus, totaling the target population to 78 participants. Snowball sampling was used to conduct the research, where the deans were asked to forward the survey link to their department chairs. This form of sampling has the advantage of recruiting a larger number of participants; however, using this process while ensuring the respondent’s anonymity prevented me from knowing exactly who participated in the study. Consequently, a breakdown of the respondent’s position was not measurable. Additionally, the 12 campus IR office directors were also invited to participate in the study; however, the participation rate was not significant, therefore the few responses were eliminated from the study altogether.
The stratified sampling procedure was used to identify the campuses participating in the study; however, once identified, all the college deans within the selected campuses were invited to participate. Stratified sampling is a type of probability sampling where the population is divided based on some specific characteristic (Creswell, 2005). In this study, the 23 campuses were stratified based on their total enrollment size. The three different campus sizes include small, fewer than 12,000 total enrollments; medium, total enrollment from 12,001 to 30,000; and large, enrollment sizes greater than 30,000. Four campuses from each group were randomly selected. The enrollment size was selected as the stratifying factor, because it was used as a control variable. Control variables, according to Creswell (2005), are a type of independent variable that are of secondary interest and are not directly measured but controlled through statistical or design procedures. Additionally, this approach guaranteed that the sample included representation from each campus size. Even though the research questions did not include campus size as a factor to consider for decision-making practices, campus size was important to the study, as it provided additional insight on how the different institutions function.

**Instruments and Procedures**

**Survey Development**

The instrument used to collect data for this study was a 40-question survey (Appendix A), that was developed and reviewed by a review group consisting of two faculty members, one department chair, one Provost, and one director of Institutional Research at one of the large size participating campuses within the system under review. The instrument was designed with three general themes in mind. The first theme assessed the respondents’ perception about their campus culture. The questions attempted to address the respondents’ perception on their campus organizational characteristics, as discussed by Kezar (2001). With Research Question one in
mind, where the goal was to see if there is a relationship between organizational characteristics and data used for decision-making, the questions in this group were identified as independent variables. Even though the design intended to prevent double barreling and ensure clarity of questions, three respondents felt the questions overlapped. Appendix E lists the comments received from the last question on the survey.

The second theme on the survey instrument addressed how the participants perceive their campus’s leadership view on data use. The questions related to this theme were mostly dependent variables. The third theme assessed the respondent’s view on the role of their campus Institutional Research Office. The goal was to understand how they perceive the role of their IR office on their campus and the level of utilization. The questions relating to this theme were also dependent variables, as they provided insight on data use. In the analysis section below, additional detail is provided on how factoring was used to identify dependent and independent components of regression models. Even though during the instrument design phase each question was assigned to a variable type; during the data analysis phase, the variables were grouped into few factors depending on their factor score. Table 3.1 provides details about each survey question. The first column is the question number, column two contains the short name assigned to each question, column three defines the variable type assigned to the question during instrument design phase, and column four lists the factor the question was assigned to after data collection and analysis. The factor analysis results pointed to six survey questions with low correlations to other questions that could not be clustered with any other factor, therefore, they were eliminated from the study.
The last four questions in the survey instrument were dedicated to learning more about
the respondents and their campus size. The last question provided them with opportunity to
comment on the topic (Appendix E). Since the survey contained several sensitive questions, such
as the respondents’ views toward the leadership or how they perceive their campus, instilling a
sense of confidentiality in the instrument was a concern; consequently, particular attention was
given to details on the type of demographic information requested.

Table 3.1
Survey Question Defined

<table>
<thead>
<tr>
<th>Question No.</th>
<th>Short Name</th>
<th>Variable Type</th>
<th>Factor Analysis results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Best campus</td>
<td>IV</td>
<td>Question eliminated</td>
</tr>
<tr>
<td>2</td>
<td>Clear Mission</td>
<td>IV</td>
<td>Independent Variable</td>
</tr>
<tr>
<td>3</td>
<td>University values status</td>
<td>IV</td>
<td>Rest IV</td>
</tr>
<tr>
<td>4</td>
<td>Many approve change</td>
<td>IV</td>
<td>Question eliminated</td>
</tr>
<tr>
<td>5</td>
<td>Chaotic decision-making</td>
<td>IV</td>
<td>Independent Variable</td>
</tr>
<tr>
<td>6</td>
<td>Decentralized campus</td>
<td>IV</td>
<td>Independent Variable</td>
</tr>
<tr>
<td>7</td>
<td>Faculty Commitment to vision/mission</td>
<td>IV</td>
<td>Independent Variable</td>
</tr>
<tr>
<td>8</td>
<td>Staff Commitment to vision/mission</td>
<td>IV</td>
<td>Independent Variable</td>
</tr>
<tr>
<td>9</td>
<td>Shared decision-making power</td>
<td>IV</td>
<td>Independent Variable</td>
</tr>
<tr>
<td>10</td>
<td>Tenured vs. non-commitment</td>
<td>IV</td>
<td>Question eliminated</td>
</tr>
<tr>
<td>11</td>
<td>Common goals awareness</td>
<td>IV</td>
<td>Independent Variable</td>
</tr>
<tr>
<td>12</td>
<td>Positive image concerns</td>
<td>IV</td>
<td>Question eliminated</td>
</tr>
<tr>
<td>13</td>
<td>Politically charged</td>
<td>IV</td>
<td>Question eliminated</td>
</tr>
<tr>
<td>14</td>
<td>Depts. Rely on each other</td>
<td>IV</td>
<td>Independent Variable</td>
</tr>
<tr>
<td>15</td>
<td>Data used for reporting only</td>
<td>DV</td>
<td>Independent Variable</td>
</tr>
<tr>
<td>16</td>
<td>Data used to make decisions</td>
<td>DV</td>
<td>Dependent variable</td>
</tr>
<tr>
<td>17</td>
<td>Campus values hunches</td>
<td>DV</td>
<td>Independent Variable</td>
</tr>
<tr>
<td>18</td>
<td>Comfortable with analyzing data</td>
<td>DV</td>
<td>Independent Variable</td>
</tr>
<tr>
<td>19</td>
<td>Uses data to evaluate programs</td>
<td>DV</td>
<td>Independent Variable</td>
</tr>
<tr>
<td>20</td>
<td>Leader – encourage data use</td>
<td>DV</td>
<td>Independent Variable</td>
</tr>
<tr>
<td>21</td>
<td>Leader – major decisions uses data</td>
<td>DV</td>
<td>Dependent variable</td>
</tr>
<tr>
<td>22</td>
<td>Leader – Substantiate decisions</td>
<td>DV</td>
<td>Dependent variable</td>
</tr>
<tr>
<td>23</td>
<td>Leader understands data</td>
<td>DV</td>
<td>Dependent variable</td>
</tr>
<tr>
<td>24</td>
<td>Leader uses data for reporting only</td>
<td>DV</td>
<td>Independent Variable</td>
</tr>
<tr>
<td>25</td>
<td>Leader rewards data use</td>
<td>DV</td>
<td>Dependent variable</td>
</tr>
<tr>
<td>26</td>
<td>Leader asks for dashboards</td>
<td>DV</td>
<td>Independent Variable</td>
</tr>
<tr>
<td>27</td>
<td>Leader communicates common goals</td>
<td>IV</td>
<td>Independent Variable</td>
</tr>
<tr>
<td>28</td>
<td>IR – active</td>
<td>DV</td>
<td>Independent Variable</td>
</tr>
</tbody>
</table>
The survey instrument was piloted to the department chairs and directors at the Michael D. Eisner College of Education at California State University, Northridge. The Dissertation Chair for this study sent an invitation email along with the survey instrument to the pilot group. The group was given two weeks to complete the survey with a reminder email sent on the seventh day. Five out of seven administrators completed the survey and sent it back via email. Out of five participants, only one provided additional feedback on the instrument. The feedback was regarding lack of clarity on the term “data”. The survey instrument was revised to include a statement defining the word data. Though the number of participants was low, the overall results of the pilot test inferred reliability of the instrument.

**Survey Reliability and Validity**

Reliability and validity are two separate terms that sometimes overlap. According to Creswell (2005), reliability is a measure of consistency and “the goal of a good research is to have measures or observations that are reliable” (p. 159). Some of the reasons that an instrument can be unreliable include: (a) ambiguous and unclear questions, (b) procedures of survey administration vary for participants, or (c) the participants guess the answers. Based on the feedback received from the pilot group, the survey appeared reliable (Creswell 2005). Few study
participants, however, voiced concerns about the questions being repetitive and irrelevant to the research study; most of which had no clear understanding about the research, or the context of the study.

Validity, according to Creswell (2005), is a measure of ensuring the instrument is performing its intended use. The survey instrument for my study meant to measure the perception of the decision makers on their respective campus’s organizational characteristics, and their perception on data use on their campus. The issue of validity was first addressed during the design of the survey. The survey was reviewed by the Dissertation Chair of this study, the quantitative inquiry professor, the department chair for Systems and Operations Management (SOM), the director of Institutional Research (IR) at CSUN, and the CSUN Provost. The feedback provided was invaluable and was incorporated in the instrument. The types of feedback received ranged from cosmetic, grammatical, and uniformity issues, to unclear and double-barreled questions. Many of the questions on the survey related to the respondent’s perceptions; hence, the word feel was used often. Most of the reviewers had a common belief to replace the word “I feel” with “I believe”. In retrospect, the time spent on the design of this survey could have been extended with a more in-depth review of each question to ensure the study measured what was intended.

Data Collection

Administering the instrument is important in drawing valid inferences from the results. Per Creswell (2005), the validity of the scores is threatened when the survey administration standards are lacking, the timing and conditions of administration, or the participants’ expectations are different. For this study, after the 23 campuses were stratified based on size and 12 universities were randomly selected, the data collection process began. The first step was
assembling email addresses of all college deans for each university. An invitation email was then sent. The invitation included the purpose of the study, a link to the SurveyMonkey survey and an explanation of confidentiality to the participant’s responses. Additionally, the email contained a sentence about implied consent to participate upon completion of the survey. The Snowball sampling method, a technique where the researcher asks participants to identify others to become members of the study sample was utilized for recruiting additional participants, hence, the invitation email requested that the college deans to forward the email to their department chairs. By using this process, however, I gave up knowing exactly what individuals will be in the sample. The invitation email content is provided in Appendix B. The content of a second reminder email to the college deans, ten days prior to the close of the survey, is also provided in Appendix C.

The data was collected utilizing a web-based tool called SurveyMonkey. Given that the entire population within the selected university was targeted to participate, neither advertisement, nor screening was used. Table 3.2 depicts the timeline used to complete the study. To alleviate any validity threats, the same procedure was utilized to collect the data for all participants. Even though I was aware who would receive the invitation email, the respondent’s identity was not exposed in SurveyMonkey. The study did not involve any deception and the participants were given the opportunity to request the results of the study. Once data was gathered, I downloaded the data to an excel spreadsheet from SurveyMonkey to analyze. A software application called SPSS, developed by IBM, was used to analyze the data. The data analysis process is discussed further in the next section.
<table>
<thead>
<tr>
<th>Task</th>
<th>Approximate Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Email College Deans and IR directors to solicit their help</td>
<td>February 15, 2016</td>
</tr>
<tr>
<td>Invitation email to department chairs - survey period officially begins</td>
<td>February 29, 2016</td>
</tr>
<tr>
<td>Survey closing date reminder email to the department chairs.</td>
<td>March 15, 2016</td>
</tr>
<tr>
<td>Survey period officially closed</td>
<td>March 30, 2016</td>
</tr>
</tbody>
</table>

**Data Analysis**

Prior to conducting the data analysis, data had to be organized, prepared, and scored. This process began with cleaning the obtained data, and involved assessing the database for missing data, where the respondent skipped over a question. There were no missing data from any of the received surveys. Scoring the data was the next step in preparing data for analysis. Thirty-five out of the 40 survey questions were assessed on a five-point, Likert-type scale, ranging from strongly agree to strongly disagree where a numeric score was assigned to each scale. *Strongly disagree* had a score of one, *disagree* scored at two, *agree* scored at three, and *strongly agree* scored at four. The respondents had a fifth option of *I don’t know*, which was coded as zero. Each question was then reviewed to determine the positivity or negativity of the question, at which point the response scores were reversed for the negative questions to ensure the scores’ congruency.

The final steps in data preparation for analysis were factor analysis and factor reliability analysis. As stated previously, factor analysis, a data reduction tool, was used to remove redundancy or duplication from the variables set, which correlated variables with a smaller set of “derived” variables. The Kaiser-Guttman rule, a commonly used guideline for determining
which factor to use, states that the number of factors to be extracted should be equal to the number of factors having an eigenvalue greater than one (IDRE, 2016). The results of the factor analysis and factor reliability analysis suggested seven factors to consider in this study. Consequently, the results pointed to six survey questions with low correlations to other questions that could not be clustered with any other factor. The elimination of some of the survey questions was an indication of possible imperfect survey design planning.

**Research Questions**

This study addressed two research questions that are considered to be rational in nature:

1- Do HEI unique characteristics have an impact on using data for decision making?

2- If yes, then which of the characteristics are most influential on data usage?

Relational type questions, according to Creswell (2005), seek to learn more than respond to a single question, but attempt to examine the relationship between two or more variables. This study originally hypothesized a relationship exists between HEI characteristics and the data use for decision-making. The study also originally hypothesized that at least one aspect of the HEI culture is influential on data use, but it will not likely be for decision-making purposes. Chapter four discusses whether these hypotheses were either realized or not.

**Statistical Method**

This study employed a correlational study design. Within this design, multiple regression modeling was utilized to define the relationships between the dependent and independent variables. According to Creswell (2005), correlations testing is ideal in providing context when dealing with many variables, and in establishing a pattern of relationships. Additionally, multiple regression analysis reveals that the linear combination of two or more independent variables significantly predict the attitude toward data use.
For most of the relevant variables in this study the level of measurement was continuous, therefore, the Pearson’s correlation coefficient was utilized. Correlation coefficient is the degree of association between two variables and is a number between -1.00 to +1.00, where a correlation of coefficient of 0.00 is indication of no linear association between the variables (Creswell, 2005). Additionally, coefficients were tested for statistical significance. If the coefficients were not statistically significant, even if the strength of the correlation was strong, i.e., r = 1.00 or -1.00; the relationship between the two variables was not significant.

The last five questions on the survey instrument were descriptive in nature; hence, a descriptive analysis was performed to understand the respondents’ point of reference. Additionally, even though the research questions did not include the impact of campus size and respondents’ discipline affiliation on data use, I decided to analyze their impact on data use for decision-making. Some statisticians and researchers may disapprove this practice, and believe this was a form of data mining, which has a connotation of searching for data to fit preconceived ideas (Grover & Mehra, 2008). In this study, however, sheer curiosity was the driver for analyzing the campus size and discipline affiliation and their impact on data use. Thus, campus size variables, since nominal, were dummy-coded to convert the sizes into bivariate options of large or not large; combining small and medium campuses into one variable as “not large”. Moreover, the respondents' discipline affiliation were also recoded to bivariate options. The decision was made to determine whether affiliations with social sciences had any influence in data use versus non-social sciences affiliation.

**Pilot Analysis and Results**

The pilot participants were too few to conduct a statistically sound analysis; however, the correlation test was run. The result derived was a table with the 19 independent variables on the
x-axis, and 16 dependent variables on the y-axis. Each cell in that table included the Pearson coefficient value, the probability value, and the number of observations. The result of the analysis indicated that no significant relationships exist between any of the 19 independent variables and 16 dependent variables. Furthermore, the number of observations was not significant to infer any conclusions of the pilot study.

Summary

Kezar (2001) argues that if leaders want to be successful in facilitating change, they need to understand the current state of their organization. This understanding would require research of historical data. It is important to note that the concept of managing by reviewing past outcomes and researching available current information, is still foreign to many organizations, including HEIs. With improved information systems and knowledge management, one can anticipate this concept to become a vital tool in the decision-making process. This study intended to bring awareness to policy and decision makers on the impact of organizational characteristics and the collective inclination to use information and research to gain wisdom for decision-making. Ultimately, this study brought to light the influence of perceived organizational characteristics on data use for decision making in this particular university system. The results were not startling as hypothesized. Higher education institutions’ culture of shared governance, interdependent nature and their multiple power and authority landscape, have an impact of use of data. Chapter four investigates how these findings may ultimately impact how policy and decision makers view the use of data in the future.

CHAPTER 4 – DATA ANALYSIS AND FINDINGS

According to Winston (1998), higher education institutions, need to understand of their unique industry as they engage in organizational change. This means that HEIs need to develop
their own change concepts, language, and processes that represent their value system and culture. There are two main reasons why it is important to develop a unique change approach for higher education: “(1) overlooking these distinctive characteristics may result in mistakes in analysis and strategy, and (2) using concepts foreign to the values of the academy will most likely fail to engage people who must bring about the change.” (Kezar, 2001, p. 59). As discussed earlier, Kezar (2001) helped gather 13 unique characteristics of HEIs, which were concealed, but at times, visibly included in the survey questions. This study sought to not only examine these unique characteristics impact on using data for decision-making, but also to establish the main HEI characteristics that may be influential on data use for decision-making. The 40 question research survey focused on the respondents’ perception of their campus culture, personal outlook on data use for decision-making, and the level of activity of their institutional research on their campus. The IR activity level was investigated based on Leimer’s (2012) work on data use in HEIs. This chapter presents the survey results and data analysis for the primary research questions: Do HEI unique characteristics have an impact on using data for decision making? If yes, then which of these characteristics are most influential on data usage?

Using the factor analysis process, highly correlated questions were clustered into four factors, (a) mission clarity and commitment, (b) active IR office, (c) data use for reporting purposes, and (d) data use competency. Results indicated there was indeed a relationship between data use for decision-making in higher education institutions and their unique characteristics. The third factor (data use for reporting purposes) was determined to have the most influence on data use and could be linked to HEIs’ shared governance, interdependent
nature, and the existence of multiple power and authority which are three of the 13 characteristics discussed by Kezar (2011). Higher education institutions’ loosely coupled system, along with their decentralized decision-making structure, reveals their shared governance nature. Similarly, it is important to note that HEIs do not operate independent of federal government, disciplinary societies, and other forces, hence, divulging their interdependent nature. Finally, there are distinctive power processes used among academic and administrative areas within the HEIs, but there are multiple levels of power and authority among trustees, the state, and the “occasional charismatic individual” (Kezar, 2001, p. 69).

Prior to conducting the data analysis, the data was organized, prepared, and scored. The process included cleaning, scoring, factor analysis, and factor reliability analysis of the data. Of the survey questions, 35 out of the 40, were assessed by the respondents on a five-point Likert-type scale, ranging from strongly agree to strongly disagree, with a numeric score assigned to each scale. Strongly disagree had a score of one, disagree scored at two, agree scored at three, and strongly agree scored at four. The respondents had a fifth option of I don’t know, which was coded as zero. Each question was also reviewed to determine the positivity or negativity of the question, at which point the negative questions response scores were reversed to ensure the score’s congruency.

Even though the study did not plan on investigating the campus size’s impact nor the respondent’s college affiliation as a factor that may impact data use for decision making, with the available data, an analysis was made to determine how these variables impacted data use. The results of this analysis indicated that neither college affiliation nor campus size had an impact on data use for decision-making. However, even though the campus size was not a determinant for data use at a campus level, evidence supported that campus size had an impact on data use at
college or department levels. In other words, in smaller-sized campuses, data use more prevalent at college and department levels than in larger-sized campuses.

Furthermore, in this chapter, the open-ended question responses from the survey were analyzed. The responses shed light on a few important aspects of data use for decision-making. One aspect concerned the IR offices not always having access to a system wide information technology infrastructure. Other aspects included the respondents’ unease about responding to certain questions, and others swayed from responding because they felt the questions were repetitive or irrelevant to the topic. Appendix D provides the email exchanges from some of the Deans, while Appendix E provides all the comments received in the open-ended question.

**Respondent’s Statistics**

A total of 78 deans from 12 different universities within the same university system were asked to participate. Snowball sampling was used to conduct the research, where the deans were asked to forward the survey link to their department chairs. This form of sampling has the advantage of recruiting a larger number of participants; however, using this process while ensuring the respondent’s anonymity prevented knowing exactly who participated in the study. Consequently, a breakdown of the respondent’s position was not measurable. Out of the total pool of 42 respondents, close to half (45%) worked on their respective campus for more than 16 years and more than half (62%) were at their current position for fewer than five years. Table 4.1 provides details about the respondents’ employment status.

Table 4.1

<table>
<thead>
<tr>
<th>Respondents’ Employment Data</th>
<th>0–5 Years</th>
<th>6–10 Years</th>
<th>11–15 Years</th>
<th>16+ Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length employed on this campus</td>
<td>21.4%</td>
<td>16.7%</td>
<td>16.7%</td>
<td>45.2%</td>
</tr>
<tr>
<td>Length in current position</td>
<td>61.9%</td>
<td>16.7%</td>
<td>7.1%</td>
<td>14.3%</td>
</tr>
</tbody>
</table>
Furthermore, 28.6% of the respondents worked on small-sized campuses with enrollment less than 12,000 students, 9.5% worked in medium-sized campuses with 12,000 to 30,000 students, and 61.9% reported working on large campuses with more than 30,000 students. Figure 4.1 depicts the breakdown of campus sizes.

![Figure 4.1. Respondents’ campus size](image)

The respondents’ discipline affiliations are depicted in Figure 4.2 with the majority in the education field, which has always been described as “data rich but information poor” (Data Quality, 2010, p. 1). Historically for compliance purposes, educators have valued data as a tool to inform continuous improvement of student outcomes. Another reason most respondents were affiliated with the education field, may have been their willingness to support a student from their college.

A total of nine discipline options were provided in the survey. As mentioned earlier, respondents’ discipline affiliation and its impact on data use was not included in the research question; however, with the available data, impact on data use was investigated. Because
Discipline affiliation was a categorical predictor variable, it could not directly be entered into a regression model and meaningfully be interpreted, therefore, the variable was dummy-coded into a dichotomous variable.

Figure 4.2. Discipline affiliation and social sciences categorization

Dichotomous variables provide the advantage of direct entry into the regression model (Creswell, 2005). In order to divide the nine disciplines taught in this university system into two distinguished variables, emphasis was focused on social sciences versus connections to science, technology, engineering, or mathematics. Figure 4.2 depicts the percent of each respondent’s discipline and the categorization of the nine disciplines into the two categories. In the next section, a factor analysis, a data reduction tool used to remove redundancy or duplication from a set of variables to represent correlated variables with a smaller set of “derived” variables, is
discussed. Results for each research question (RQ) and an interpretation summary of the findings will then be provided.

**Factor Analysis**

The survey data provided an opportunity for examining the various factors impacting the use of data on participating campuses. Factor Analysis allows for describing many variables using a few factors depending on their factor score (Field, 2009). A complex algorithm using SPSS to clustered the variables. The items clustered around the same factors suggesting the underlying dimensions of personal attitudes toward a certain construct. The logic considered many aspects of the survey questions including the respondent’s perception of each question based on their response. After removing the demographic and open-ended questions (questions 36 to 40), I ran a factor analysis on SPSS. Determining the number of factors to be used was not a straightforward task. Applying the Kaiser-Guttman rule (IDRE, 2016), the study results suggested seven factors to consider in this study. Consequently, the results pointed to six survey questions with low correlations to other questions that could not be clustered with any other factor. Therefore, the following questions were eliminated:

1. My campus is one of the best campuses in the system.
2. On my campus, several people need to approve any program or course changes.
3. My campus is politically charged.
4. My department is concerned about the campus’ positive image and status.
5. The IR in my campus can be expanded to provide more useful data.
6. In my college, I believe tenured faculty are more committed to the mission and vision of the university than non-tenured.
Furthermore, a reliability test on seven factors with Eigenvalue greater than one to obtain the Cronbach’s alpha figure was conducted. According to IDRE (2016), Cronbach’s alpha is a measure of how closely related a set of items are as a group and is considered to be a measure of scale reliability. Two factors with a Cronbach alpha less than .1 were removed. A third factor was removed due to construct overlap with other factors, making it difficult to label. The factor labeling was based on the theoretical framework of the study and aimed at combining the 13 HEI characteristics into one factor. Consequently, four clear interpretable factors with support for the sound, psychometric properties of the survey questionnaire were derived. Table 4.2 lists the exploratory factor analysis results for the four factors and lists their rotated factor loading, their Eigenvalue, Cronbach’s alpha measure of reliability, and the amount of variance explained by each factor. The results of the factor reliability analysis showed that factors one, two, and three had high reliabilities (Cronbach’s alpha greater than .7), while factor four had relatively lower reliability with Cronbach’s alpha of .69. The four factors were labeled and are discussed in more detail below. Moreover, five survey questions were clustered together to define the dependent variable for research questions. A fourth factor (data competency) was identified and was also used as the dependent variable because it measured the data use or willingness to use data at the college or department level. Both dependent variables will be discussed in more detail below.

Since the theoretical framework of this study was on Kezar’s work on HEIs’ unique characteristics (2001), an attempt to connect the variables derived from the factor analysis to each characteristic, when applicable was made. In addition to connecting Kezar’s HEI characteristics, the factor analysis also revealed Leimer’s (2012) work on the role of institutional research office
Table 4.2  
*Summary of Exploratory Factor Analysis Results*

<table>
<thead>
<tr>
<th>Question</th>
<th>Mission Clarity and Commitment</th>
<th>Active IR Office</th>
<th>Data Use for Reporting</th>
<th>Data Use Competency</th>
</tr>
</thead>
<tbody>
<tr>
<td>My campus is clear about its mission.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My campus values its status in the community.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I believe the leadership on my campus works hard to communicate the University’s common goals.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I believe in my campus. major decisions are made in a chaotic manner.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I believe the departments in my college rely on one another to get work done.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>On my campus, I believe the staff is committed to the vision and mission of the university.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The IR on my campus provides very useful information.</td>
<td></td>
<td></td>
<td></td>
<td>.85</td>
</tr>
<tr>
<td>I often contact my campus’ IR for information.</td>
<td></td>
<td></td>
<td></td>
<td>.84</td>
</tr>
<tr>
<td>I often use the reports I receive from IR to make decisions for my department.</td>
<td></td>
<td></td>
<td></td>
<td>.57</td>
</tr>
<tr>
<td>My campus has a very active IR.</td>
<td></td>
<td></td>
<td></td>
<td>.53</td>
</tr>
<tr>
<td>The leadership on my campus use data for reporting purposes only.</td>
<td></td>
<td></td>
<td></td>
<td>.85</td>
</tr>
<tr>
<td>I believe in my campus. Data are used for reporting purposes only.</td>
<td></td>
<td></td>
<td></td>
<td>.79</td>
</tr>
<tr>
<td>The leadership on my campus often asks for dashboards to determine my department’s success.</td>
<td></td>
<td></td>
<td></td>
<td>.62</td>
</tr>
<tr>
<td>I am comfortable with analyzing data and drawing conclusions.</td>
<td></td>
<td></td>
<td></td>
<td>.88</td>
</tr>
</tbody>
</table>
I like working with data. I use data to evaluate my programs.

<table>
<thead>
<tr>
<th>Eigenvalues</th>
<th>5.84</th>
<th>3.06</th>
<th>2.57</th>
<th>1.86</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of Variance</td>
<td>24.32</td>
<td>12.76</td>
<td>10.69</td>
<td>8.50</td>
</tr>
<tr>
<td>A</td>
<td>.75</td>
<td>.81</td>
<td>.76</td>
<td>.69</td>
</tr>
</tbody>
</table>

and data use and knowledge as possible predictors. Table 4.3 provided a list of constructs discussed in chapter two with possible connections to each factor.

Table 4.3

Factors and how they relate to the Study’s Constructs

<table>
<thead>
<tr>
<th>Factor</th>
<th>Possible Corresponding Construct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor One</td>
<td>HEI’s value-driven nature (Kezar)</td>
</tr>
<tr>
<td>Mission Clarity and Commitment</td>
<td>HEI’s employee commitment (Kezar)</td>
</tr>
<tr>
<td></td>
<td>HEI’s institutional status (Kezar)</td>
</tr>
<tr>
<td></td>
<td>HEI’s culture of academy (Kezar)</td>
</tr>
<tr>
<td></td>
<td>HEI’s independence from environment (Kezar)</td>
</tr>
<tr>
<td></td>
<td>HEI’s loosely coupled nature (Kezar)</td>
</tr>
<tr>
<td></td>
<td>HEI’s Image and Success (Kezar)</td>
</tr>
<tr>
<td></td>
<td>HEI’s Goal Ambiguity (Kezar)</td>
</tr>
<tr>
<td></td>
<td>HEI’s Professional and Administrative values (Kezar)</td>
</tr>
<tr>
<td></td>
<td>HEI’s organized anarchical decision structure (Kezar)</td>
</tr>
<tr>
<td>Factor Two</td>
<td>Leimer’s work on IR utilization</td>
</tr>
<tr>
<td>Active Institutional Research Office</td>
<td></td>
</tr>
<tr>
<td>Factor Three</td>
<td>HEI’s shared governance system (Kezar)</td>
</tr>
<tr>
<td>Data Use for Reporting</td>
<td>HEI’s multiple power and authority (Kezar)</td>
</tr>
<tr>
<td></td>
<td>HEI’s interdependent nature (Kezar)</td>
</tr>
<tr>
<td>Factor four</td>
<td>Leimer’s work on data use</td>
</tr>
<tr>
<td>Data use Competency</td>
<td></td>
</tr>
</tbody>
</table>

Factor One - Mission Clarity and Commitment

Factor one with the highest Eigenvalue (5.837) and the highest percent in variance (24.32%) was labeled mission clarity and commitment. The theme for the six survey questions was “Mission” because higher education institutions have a distinct mission or intention. For instance, Kezar discussed the “institutional status” as one of HEIs’ unique characteristics. This status refers to their long-standing mission that was closely related to an ongoing societal need
(Kezar, 2001). Because of this societal need or standing mission, HEIs are less likely to change. Another example of how mission can be linked to some of the HEIs’ unique characteristics is the institutional emphasis on culture of academy as described by Kezar (2001). This characteristic necessitates the decision-making process in HEIs to be more consensus-based, less rational, unorganized, and without structure. Consequently, each characteristic listed in Table 4.3 for factor one represented HEIs’ goals and mission. As mentioned earlier, the SPSS algorithm for factoring led us to eliminate some of the questions, which related to the 13 characteristics. The six questions related to this factor one included:

1. My campus is clear about its mission.
2. My campus values its status in the community.
3. I believe the leadership on my campus works hard to communicate the University’s common goals.
4. I believe in my campus; major decisions are made in a chaotic manner.
5. I believe the departments in my college relies on one another to get work done.
6. On my campus, I believe the staff is committed to the vision and mission of the university.

**Factor Two - Active Institutional Research Office**

The second, strongly derived factor was labeled “active IR office.” The theme of the four questions was comparable, hence the factor was easy to label. The factor is in accordance with Leimer’s (2012) work, which asserted that HEIs’ IR office level of involvement was a major element that kindled and sustained an evidence-based decision-making process. The four questions related to this factor two included:

1. The IR in my campus provides very useful information.
2. I often contact my campus’ IR for information.
3. I often use the reports I receive from the IR to make decisions for my department.

4. My campus has a very active IR.

**Factor Three – Data Use for Reporting**

Since the three related questions to this factor focused on the respondent’s perception on how or why data was used on their campuses; factor three was relatively easy to label. All three questions referred to the use of data for reporting purposes only. One of the unique HEI characteristics, as defined by Kezar (2001), included the HEIs’ shared governance system, which meant that trustees or board of regents have ultimate governance authority over certain areas of institution, such as finance and resource allocations at a strategic level. Ultimately, the tactical resource allocation decisions are made between faculty and campus administration. Hence, this factor is a composite of Kezar’s shared governance characteristics and Leimer’s (2012) work on how accreditation agencies were major promoters for using data in decision-making in HEIs and how data use for reporting increased during the accreditation process.

Furthermore, the funding process for many public and private institutions require proper reporting. HEIs’ interdependent organizational structure requires it to operate with dependence on disciplinary societies, federal government, and other significant forces (Kezar, 2001). Hence, factor three encompasses the interdependent nature of HEIs as a second characteristics discussed by Kezar (2001).

A third HEI characteristic that relates to this factor was a HEI’s multiple power and authority structure. According to Kezar (2001), HEIs not only have a unique power structure, they also have a competing authority structure (p. 69). There are four kinds of authority systems in HEIs that are constantly competing (Clark, 1991a). They include:
1. Academic authority – Maintained by faculty and is entrusted in other subgroups such as unions and disciplinary associations. Tend to be based on expert power.

2. Enterprise-based authority – maintained by those who are legally responsible and must act on the institution’s behalf such as trustees and campus administrators. Can be bureaucratic authority and is based on reward and legitimate powers.

3. System based authority – maintained by governmental, political, and academic oligarchy such as accreditation agencies or board of governors. Based on legitimate and reward power as well.

4. Charisma authority – refers to the willingness of a group to follow a person because of that person’s unique personal character. Such as a particular president or faculty member.

The third factor related to the authorities with legitimate and reward powers and their requirements in order to sustain the organization. This factor also confers with Leimer’s (2012) work stating that data use increases around accreditation time. The “why” data used in HEIs, perhaps is the best way to describe this factor. The three questions relating to this factor three included:

1. The leadership on my campus used data for reporting purposes only.
2. I believed on my campus, data was used for reporting purposes only.
3. The leadership on my campus often asked for dashboards to determine my department’s success.

**Factor four – Data use Competency**

This factor was labeled based on the respondent’s perception and knowledge of data. The factor was not difficult to label, as the three questions were similar. This factor was used in the regression model one as an independent variable, since it focused on the respondent’s attitude
toward data. This factor echoed well with Leimer’s (2012) work on data use resistance and lack of knowledge of its use. Unlike the other three factors, factor four was used as the dependent variable in regression model two, which analyzed the association of data use based on college discipline. The questions for factor four included:

1. I am comfortable with analyzing data and drawing conclusions
2. I like working with data
3. I use data to evaluate my program

**Dependent variables**

As mentioned earlier, in this study, the dependent variable was the respondent’s perception to the extent to which data was used on their campus for decision-making. A composite of five survey questions was used to address both research questions. They included:

1. I believe that my campus using data to make decisions is common
2. The leadership on my campus uses data to make major decisions
3. The leadership often uses data to substantiate a decision
4. The leadership on my campus has a deep understanding of data and its use
5. The leadership on my campus rewards those who substantiate their decisions with data

For research question four, one factor was used as the dependent variable, since it addressed the competency and outlook of the college dean or department chair toward data use.

Now that I have discussed each of the four factors with their own unique construct and how the dependent variables were derived, I will attempt to explain the degree of association between them. Two regression models were used to answer the research questions. One revealed how the linear combination of the four factors (mission clarity and commitment, active IR office, data use for reporting, data use competency), and the campus size, impacted the use of data for
decision-making on campus level. The other multiple regression analysis revealed how adding discipline affiliation to the mix impacted data use at the department or college level. Table 4.4 provides the means and standard deviation for the dependent and independent variables.

Table 4.4

**Mean and Standard Deviation of Dependent and Independent Variables**

<table>
<thead>
<tr>
<th>Variable/Factor</th>
<th>n</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor One – Mission Clarity and Commitment</td>
<td>42</td>
<td>3.07</td>
<td>0.54</td>
</tr>
<tr>
<td>Factor Two – Active Institutional Research Office</td>
<td>42</td>
<td>2.82</td>
<td>0.71</td>
</tr>
<tr>
<td>Factor Three – Data Use for Reporting</td>
<td>42</td>
<td>2.17</td>
<td>0.96</td>
</tr>
<tr>
<td>Factor Four – Data use Competency</td>
<td>42</td>
<td>3.48</td>
<td>0.48</td>
</tr>
<tr>
<td>Dependent Variable for RQ 1,2</td>
<td>42</td>
<td>2.41</td>
<td>0.86</td>
</tr>
</tbody>
</table>

**Regression Analysis One**

Regression model one addressed the research questions with the aim to understand the relationship between data use and the factors derived from the survey questions. Per the integrated decision model discussed in chapter two, the world is multivariate. In considering realistic problems, especially in higher education, relying on univariate or bivariate data leads to ineffective decisions. The various dimensions of the decision-making process as described by Barabba (2011) was utilized to produce an interactive knowledge gain process. Analytical data refers to information that is quantitatively and statistically analyzed and may include the lessons learned data bank; whereas, collaborative data is more qualitative data gathered from dialogue with subject matter experts or stakeholders. Finally, intuitive data are data from different intangible sources, including past experiences or a leader’s vision. Similarly, in quantitative analysis, multiple regression modeling is perhaps the closest tool that related to Barabba’s
interactive decision-making concept. Creswell (2005) asserted that the goal of using multiple regressions is to: (a) describe and understand a relationship, (b) predict a new observation, and (c) adjust or control a process. In this study, multiple regression analysis explained the variation in the dependent variable by the combined effect of all derived factors discussed above. The dependent variable for this model was the use of data on campus for decision making, and the independent variables were mission clarity and commitment, active IR office, data use for reporting, data use competency, large campus size, and medium campus size. Table 4.5 provides this regression model’s results summary.

Table 4.5

Regression Model One Results

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>.553</td>
</tr>
<tr>
<td>R Square</td>
<td>.306</td>
</tr>
<tr>
<td>Adjusted R Square</td>
<td>.187</td>
</tr>
<tr>
<td>ANOVA Sig. F</td>
<td>.036*</td>
</tr>
</tbody>
</table>

*p < .05

Research Question One

When conducting regression analysis, inference began with the $F$-test to see whether the combination of the variables explained a significant amount of variation in the dependent variable. Creswell (2005) asserted that the $F$-test was the gateway to statistical inference. The regression described in Table 4.6 reveals that there was a degree of association between one or more variables and the use of data on the participating campuses ($p = .036 < .05$). Hence, we can conclude that the model was statistically significant. In this case the statistical meaning of “significant” was slightly different from its every day usage. When a significant regression model is found, it implies that a relationship exists between data use for decision-making and the variables entered into the model, but it does not indicate whether it is a strong or useful relationship (Creswell, 2005). Thus, the results indicate there is a relationship between the HEI
 characteristics and data use for decision-making. Furthermore, Table 4.6 reveals the coefficient of determination at .306, which indicates that potentially 30% of the variance in data use for decision-making was caused by the combination of the six predictable variables. Further analysis indicated that only one of the factors had any significant impact on the dependent variable, leading to the use of adjusted R-square as the coefficient of determination (.187). Adjusted R-squared is the modified version of R-squared that has been adjusted for the number of predictors in the model (Creswell, 2005). Thus, for this model, it was noted that only 19% of the variance in data use was caused by the one variable. Research question two which aimed to understand which of the predictor variables were most influential on data use will be discussed in the next section.

**Research Question Two**

Now that the regression model was proven statistically significant, and my hypothesis for question one was confirmed, we can attempt to understand which of the variables had the most influence on data use for decision-making. In Table 4.6, the variables associated with the dependent variables and the coefficient for each are listed. Overall, the regression analysis results indicated that the factor three (data use for reporting purposes) was the only predictable variable that had any impact on data use (p = .005 < .01).

<table>
<thead>
<tr>
<th>Factor</th>
<th>Unstandardized Coefficient b</th>
<th>Std. Error</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mission commitment and clarity</td>
<td>.283</td>
<td>.177</td>
<td>.255</td>
</tr>
<tr>
<td>Active Institutional Research office</td>
<td>-.010</td>
<td>-.008</td>
<td>.957</td>
</tr>
<tr>
<td>Data use for reporting only</td>
<td>.427</td>
<td>.478</td>
<td>.005*</td>
</tr>
<tr>
<td>Personal outlook on data</td>
<td>-.275</td>
<td>-.153</td>
<td>.401</td>
</tr>
<tr>
<td>Large Campus</td>
<td>-.146</td>
<td>-.083</td>
<td>.690</td>
</tr>
</tbody>
</table>
As discussed in the factor analysis section, factor one (mission commitment and clarity) was a composite of 10 of Kezar’s unique HEI characteristics. The results indicated that factor one was not a statistically significant determinant in the use of data on campuses. In other words, the use of data for decision-making is not part of the mission of the university. Similarly, factor two (active IR office), factor four (data use competency), and campus size were not statistically significant determinants for data use for decision-making.

The regression standardized β, however, demonstrated a positive relationship between the use of data and factor three (data use for reporting purposes). Forty-three percent (unstandardized b = .427) of the variance in data use on the researched campuses was accounted for by the need for reporting. This finding addressed research question two, and was in accord with HEIs’ shared governance system, interdependent nature, and multiple power and authority structures as discussed by Kezar (2001). In the next chapter, I will discuss the implications of this finding and will attempt to trace one of the recent decisions in this university system as a case study to this finding.

**Regression Analysis Two**

Regression model two aimed to understand the relationship between data use at the college level and all the other independent variables. The predictor variables for this model included (a) factor one (mission clarity and commitment), (b) factor two (active IR office), (c) factor three (data use for reporting), and (d) campus size variables. As indicated in Table 4.7, the regression model proved to be statistically significant (p = .004 < .05). The model also revealed that the adjusted R-Squared was .3, which indicated that 30% of the variance in data use at the college or department level for decision-making was caused by the predictable variable.
Because the regression model has proven to be statistically significant, I continued analyzing the coefficient results to determine if college discipline, specifically the Social Sciences field, had any impact on data use at the department or college level. Table 4.8 lists the model’s coefficient summary, which indicated that discipline was not statistically significant as a predictor of data use in the college or department levels. The model, however, revealed an interesting finding about campus size. Evidently, campus size was a statistically significant predictor of data use at the college or department levels ($p = .000 < .01$). The unstandardized coefficient of $-0.677$ indicated that large campuses had a reverse correlation with data use at the college and departmental levels, with small-sized campuses tend to utilize data at the college and departmental level. Even though this finding was not to address a research question, it an interesting finding, which can indicate smaller campuses in this university system data use for decision making may be more prevalent. Further targeted research may explain this finding.

Table 4.8

Regression Model Two Coefficient Summary

<table>
<thead>
<tr>
<th>Factor</th>
<th>Unstandardized Coefficient B</th>
<th>Standardized Coefficients Beta</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mission commitment and clarity</td>
<td>.193</td>
<td>.218</td>
<td>.156</td>
</tr>
<tr>
<td>Active Institutional Research office</td>
<td>.007</td>
<td>.010</td>
<td>.948</td>
</tr>
<tr>
<td>Data use for reporting only</td>
<td>-.057</td>
<td>-.115</td>
<td>.435</td>
</tr>
<tr>
<td>Discipline (Social Sciences)</td>
<td>-.162</td>
<td>-.155</td>
<td>.307</td>
</tr>
<tr>
<td>Large campus</td>
<td>-.677</td>
<td>-.696</td>
<td>.000*</td>
</tr>
<tr>
<td>Medium campus</td>
<td>-.347</td>
<td>-.215</td>
<td>.148</td>
</tr>
</tbody>
</table>

*p<.01
Analysis of Findings

As discussed in chapter two, one of the visions of the Doctoral Program in Educational Leadership and Policy where this paper is a partial fulfillment of, is to ensure its scholars learn to lead through: (a) collaboration, (b) action research, (c) cultural proficiency, and (d) systemic reform (Doctoral Program in Educational Leadership Handbook, 2013). My focus in this study has been planning systemic reform and managing the change process. According to the Doctoral Handbook (2013), in order for profound change to take place, “leaders need to understand, navigate, respond to, and influence the larger policy environment and the political, social, economic, legal, and cultural context of education” (p. 2). Hence, educational leaders need information or data, specifically about the components mentioned above, to implement systemic change. With the increasing concerns about accountability among higher education institutions, making decisions based on data is foundational in improving decision-making practices. Additionally, understanding HEIs unique organizational characteristics will promote the change process, leading to effective policies.

My study aimed at understanding the impact of HEIs’ unique characteristics on the use of data as a decision tool. The study results confirmed the hypothesis that HEI characteristics have an impact on data use, but not necessarily for decision-making. The study results also affirmed that three out of 13 HEI characteristics have an impact in data use. These three characteristics, shared governance, multiple power and authority, and interdependent structure will be discussed further in this section.
Shared Governance

When HEIs began to liberalize many of their processes in the 1960s, the system of shared governance began to evolve to include more and more representation in the decision-making process (Olsen, 2009). Moreover, Olsen (2009) asserts that “…all legal authority in any university originates from one place and one place only: its governing board” (par. 7). The board then typically delegates authority for the day-to-day operation of the institution to the president, who then delegates authority over certain parts of university management to other university officials.

By studying how shared governance works in HEIs, we can understand how decisions are made, where the processes vary according to types of stakeholders, time-frames, and the number of people involved. There seems to be distinct characteristics associated with effectiveness of shared governance. Several empirical studies have tried to analyze how to facilitate shared governance, some of which have criticized the idea of academics’ dominant role by asserting that the process may be too slow in situations requiring more dynamic decision-making. Considerable evidence suggests that shared governance is far from functioning in an optimal way. Additionally, Kezar (2004) asserts that board size, unions, power allocation, and other structural factors seem to have an impact on efficiency of outcomes but not on the decisions’ effectiveness (p. 40). Clearly, when it comes to HEIs’ governance, “shared” is a concept larger than most people suspect. True, “shared governance”, however, attempts to balance maximum participation in decision making with clear accountability.

Ultimately, in this study, shared governance as one of the 13 characteristics of HEIs has proven to have an impact on the use of data in decision-making. Even if systemic data collection and reporting process existed to analyze and disseminate among all stakeholders in this
university system; the decisions made by the governing board are typically final. This finding overlaps with HEIs’ multiple authority and power characteristics.

**Multiple Powers and Authority**

Kezar (2001) defines power as the ability to influence or exercise control over others. What makes the HEI power structure unique is its reliance on referent and expert powers rather than coercive, reward, or legitimate powers. Yet the administration’s power in general is partially masked or secret, because in a collegial environment, it is socially unacceptable to exert power (Birnbaum, 1991a). Thus, implanting any change in HEIs, especially cultural change, requires a certain level of delicacy. Interestingly, Leimer (2009) argues that cultural change in HEIs is usually prompted by external pressure.

Another dilemma facing HEIs and this particular university system relates to the regional accrediting agencies requiring higher education institutions to demonstrate a culture of evidence-based decision-making. Yet, no guidance is provided on how to develop such a culture with the prevalence of multiple power and authority in HEIs. Culture is related to the change process and change processes can be thwarted by violating cultural norms or enhanced by culturally sensitive strategies (Bergquist, 1992) HEIs operate as decentralized systems, so change tends to happen more at the institutional and state levels (i.e., through multi-campus or state systems). This is quite different from other countries, where change is often mandated through the ministry of education. This is not to say change cannot be encouraged through policy. With understanding of how a HEI’s shared governance structure and its multiple powers system impact the use of data for decision-making, we can now delve into the HEI’s interdependent nature.
Interdependent Nature

As mentioned earlier, higher education institutions rely on outside sources to survive. They do not operate in a vacuum and are impacted by decisions made by other organizations internally and externally whether at the local, regional, or national level. The mixed messages HEIs receive from these multiple entities impacts what to change and how to change it (Kezar, 2001). Higher Education Institutions have undergone significant growth through federal financial aid, state grants to students, and research funding. Consequently, the increased availability of financial aid has boosted the number of students who can attend these campuses. This increased funding, however, has opened the forum for federal and state policymakers to get involved in the institutional operations, particularly those that deal with the taxpayers’ investments, such as student retention and completion. This has required HEIs to conform to new legislation and regulations on other social issues such as the Americans with Disabilities Act, Title IX, and various laws protecting employees from sexual harassment (Kezar, 2012).

Even though there is no legislation on the influence of federal and state policymakers; the extent of their involvement is dependent mostly on traditions, culture, and informal arrangements; however, with the current condition of HEIs, universities are competing for the same resources, causing the inclusion of other types of stakeholders, such as independent donors or support from local businesses, in the HEI governance to become inevitable. Use of data for decision-making is almost irrelevant if the data does not show what these multiple authorities and powers are looking for in order to fund the organization. Using data and evidence is like going on a scale often and is not easy. It requires courage on the part of leaders at all levels. McClenney and McClenney (2007) share the same view on how evidence tends to reveal our false assumptions and leads us to have those courageous conversations about inequities.
Qualitative Responses and Analysis of Findings

This section will aim at analyzing the qualitative responses on the survey instrument (Appendix A). The last survey question was an open-ended one where respondents had an opportunity to comment on any topic regarding the survey or the study. The responses categorized into four areas and discussed in this section include: (a) information technology infrastructure limitations, (b) survey design, (c) IR office, and (d) other concerns. Additionally, the respondents had an opportunity to email me and discuss other concerns or request a copy of the results. The email exchanges are provided in Appendix D, and will also be analyzed in this section.

Information Technology Infrastructure

As discussed in chapter three, one of the limitations derived after conducting the study was not investigating the system’s information technology capabilities. One respondent referred to a chronic technological issue with all 23 campuses’ technological infrastructure. Thus, the reliability of data has always been questioned accordingly and all system-level decisions are impacted by this issue. The respondent did not believe the issue was easily fixable as campuses have been provided a work around. Another respondent emphasized that data use is encouraged, but key data to make successful long-term decisions on educational delivery or resource allocation are not systematically collected, and therefore, not available. The respondent added: “…we are becoming a data-driven culture, but some significant gaps remain before we will be gathering and using all the data relevant to long-term success.”

Survey Design

Another limitation derived from this open-ended question, was the survey design and questioning methods. Several participants voiced concerns about their perceptions of the wording
of the survey questions. One participant stated that several of the questions were difficult to answer because some departments act very differently than the college or university as a whole. Another respondent indicated I should have distinguished tenured versus adjunct or full time faculty in the survey questions. One Dean also commented that the survey had many repetitive questions and he or she would not pass this on to their departments. According to Larrossi (2006), survey question inconsistencies or issues expressed by respondents, does not rest on the respondents, but rather on the question designer. The design of questions on perception of a group is perhaps one of the most tedious and difficult tasks of quantitative research. As mentioned earlier the timeline to complete a study like this did not permit detailed analysis of the survey questions. In my subsequent and continued research, I look forward to honing my craft in developing questions that will best accurately measure the phenomenon under investigation.

**IR Office**

Several respondents commented on their IR office and its functionality. One indicated that their college has a dedicated “data person”. One believed their campus IR office has improved over the years. Another comment referred to the survey design and the study’s assumption that the IR office does many of the tasks of their College Assessment Office. The respondent insinuated a concern about infrastructure again and how the IR offices have limited access to the system-wide database. Another astonishing comment about the IR office related to a VP and his or her constant interfering with enrollment data. The comment was: “I've been told by the IR Office that it is a historical problem that involves a long-standing VP who controls enrollment data.”. This comment may sound alarming, as it should, but it is not unusual for each office to produce data for a specific purpose. It also reaffirms my finding, that data was used to remain compliant and report on what the constituents like to hear. While most universities have
IR offices that report on significant information, there are many other offices of the university that participate in the reporting process. For instance, the finance department generates accounting information, colleges provide specific reports for their specialized accreditation agencies, and the registrar produces student information (Lombardi, 2013).

Other Comments

The uniqueness of higher education systems is sometimes overlooked, especially since it is usually the force and source of change in the institution. Even though HEIs have a loosely coupled structure, where connections, networks, diffusions are less prevalent (Kezar, 2001) and organizations are decentralized, some of the respondents’ comments signaled a subtle fear of authority for participating in a survey that was evaluating their campus and their leadership. Few responses whether via email or to the open-ended question, depicted the immense complexity of HEIs and the respondent’s concern about enacting change in a large system. For instance, an interim Dean at a large campus, emailed me and refused to respond to the survey in spite of confidentiality promise. He indicated that he will not forward the survey to others, and predicted that I will not succeed in collecting much data, as he or she felt the survey was more of an evaluation of several aspects of the campus and college operations. He eluded that the survey was asking him to make judgments that are, in fact, an evaluation of the senior leadership. As mentioned earlier, the survey questions were designed to obtain the deans’ and department chairs’ perception about their campus culture and characteristics. Hence, questions about leadership and campus culture had to exist, and yet this Dean was reluctant to respond. It was easy to observe a connotation of fear in his comment.

What if the survey was indeed an attempt to evaluate senior leadership? As Senge (2006) states, many organizations fall behind primarily because: “employees get stuck in a rut. Their
position becomes their identity and thus they fear change.” This dean’s reasoning for not responding was: “...the questions are not appropriate for a dean to answer.” Another interim Dean from a midsize campus referred me to the IR Director on campus to learn the steps to conduct research on their campus. Understandably, since both respondents were interim deans, it is possible they may have sensed it was not their place to comment on topics that may jeopardize their chances of becoming a permanent Dean, or may have thought this was a test by senior leadership for them.

Conceivably, these two dean’s email exchanges, provided more answers to the underlying issues of this educational system, where unexpected responses are not valued or even punished. Fear-based management is not conducive to change. (Senge, 2006). The ability to look at one’s organization impartially using historical data, in order to truly assess shortcomings, is a trait of a learning organization. Failure to acknowledge mistakes leads to making the same mistake repeatedly. As Senge (2006) suggests:

Non-learning organizations often fail to see the bigger picture due to an ingrained habit of doing so. Rather like a soccer team blaming the goalkeeper for conceding a goal, when it should be searching for the underlying problems that lead to it, such as poor defense strategy. The non-learning organizations handicap themselves by continuing to react to the consequence of an event. Learning organizations, however, look at the underlying causes of a problem, thereby presenting a solution that completely eradicates the chance of it ever occurring again. (loc.117).

**Summary**

The anatomy of decision making in HEIs is complex and context driven. In chapter five, based on my findings, I will share how decisions are made in HEIs. I also will provide an
example of anecdotal decision making practices where I have shared historical data on a policy within this university system and how the decision came about. The case study illustrates how ineffective policies impact the students, faculty, staff, and all stakeholders including the society in general. Additionally, it exemplifies how continuous improvement efforts, encouraged by accreditation agencies, seem to have minimal impact on actual practice of quality policies and decision-making. The lack of focus on end results, the shortage of effort to align parts of the educational system, and the deficiency of collaboration with upstream and downstream partners in HEIs are some of the common themes discussed in literature. Yet, with HEIs’ tendency to adopt the evolutionary change model in a relatively decentralized enterprise, little success has been observed.
CHAPTER 5: DISCUSSION AND CONCLUSIONS

This chapter provides a summary of the problem, purpose of the study, significance of the study, and overview of the methodology. A major portion of the chapter is dedicated to the detailed discussion of the findings with references made to an example of a longitudinal decision process within the university system under study. Additionally, synthesizing the existing research with my findings has provided the prospect to draw a conceptual view of a new anatomy for decision making in HEIs (figure 5.2). After this new concept is discussed, I will then delve into the implications and policy, with recommendations for future research. The chapter will end with a few recommendations and concluding comments.

Overview of the Study

Higher education institutions (HEIs) exist for a specific purpose, mission, and social function, which include (a) teaching and learning, (b) research, and (c) knowledge exchange (Godemann, et al., 2014). Public concern regarding HEIs’ effectiveness has increased the call for accountability. Additionally, this concern has pushed colleges and universities to develop effective ways to measure their performance, whether to measure a program’s success or student learning. Despite the continued demand for quality measurements, HEIs have not been keen on using data to make effective decisions. This study was conducted from the perspective of organizational change management and aimed to understand the HEI’s culture and impact on using data for decision-making. The practice of evidence-based management and organizational culture are complex and multifaceted. The study attempted to offer context regarding why evidence-based decision-making is not prevalent in HEIs’ organizational cultural ecology. Kezar (2001) provided the framework for this cultural ecology by describing 13 unique organizational characteristics of HEIs. Culture is characterized as complex patterns shared by a group, whereby
a pattern consists of mutually supporting elements including beliefs, values, and practices (Potworowski, 2012). Furthermore, the study contextualized the HEIs’ governing bodies, variously referred to as chancellors, senates, councils, or boards in different milieus; all of which engage in a powerful position at the relationship of internal and external environments of universities, where different powers meet.

Problem Statement

As more nations are aiming to develop an educated workforce, competition has intensified in terms of innovation at higher education institutions. While this has been an important part of the HEI framework for the last 50 years, evidence has shown that the number of college graduates in the United States has declined in recent years, mostly due to comparably higher dropout rates than other countries. This downward trend affects the United States’ global competitiveness (Christensen, Eyring & Eyring, 2011), and as a result, the 2020 College Completion Goal plan was introduced by President Obama, aiming to double the number of students attending college (Kezar, 2012). Furthermore, it is important to understand HEIs’ other social responsibilities. Besides teaching and training the workforce, HEIs are responsible for generating knowledge and exploring complex current problems like climate change and poverty while substantiating their findings with evidence (Godemann, et al., 2014).

Consequently, regional accrediting bodies are requiring HEIs to develop and sustain a culture of evidence-based decision-making and improvement. This has led to a “compliance-based” decision-making system, where remaining compliant is the main reason for data use, rather than making decision based on historical data obtained from previous attempts o resolve the real issues of the society. In other words, pleasing the board, legislators, and accrediting bodies has become the main purpose of data use, rather than making wise decisions. Two-thirds
of college presidents even confirmed this in a 2011 “Inside Higher Ed” survey that their institutions are not particularly strong at using data for making decisions (Leimer, 2012). My study aimed at clarifying what aspects of HEIs’ organization contribute to this finding. In an effort to make my findings more palpable, I traced a policy decision-making process that was initiated and adopted by the same university system under investigation in this study. This policy aimed at improving student graduation and retention rate by initiating remedial and developmental programs in the basic skills areas of reading, writing, and mathematics since the mid-1970s. According to Adelman (2004), about 40 percent of all college students in the United States take at least one remedial course. The estimated cost of remedial education for taxpayers is about $1 billion a year (Breneman & Haarlow, 1998).

**Purpose of the Study**

This study sought to demystify the use of data in making wise decisions for the continuous improvement in higher education institutions. Ackoff (2010) describes the road to wisdom by further clarifying the hierarchy of the types of content in the human mind: (1) data, (2) information, (3) knowledge, (4) understanding, and (5) wisdom. He believed the organizations and educational institutions “tend to focus on the lower valued aspect of the mental content, rather than on the more highly valued like understanding and wisdom” (p.54). The purpose of this study was to provide a conceptual model for how decisions are made at one of the largest university systems in the United States and whether data is effectively converted into wisdom for decision making purposes. The path from data to wisdom is referred to as “evidence”, which not only means numerical or statistical information, but it also refers to narrative evaluations, work samples, and reports, both written and verbal, as well as information obtained through various collection methods. Evidence could additionally refer to prior
experiences or leadership’s vision. Furthermore, this study discovered the role HEI culture plays in promoting or demoting evidence-based decision-making. The concept of evidence-based decision-making is a complex phenomenon. Consequently, it requires a certain level of clarification; especially since decision makers are often bombarded with data and need to be vigilant on data credibility, understand what a data provider’s perception is and the many barriers of interpreting data for effective decision-making. Furthermore, remembering the goals of decision-making, or in other words, what drives the end-results of a decision, is essential. For instance, is the decision being made to rectify a problem, create systemic reform, or to address an organizational preservation process? (W. Bellows, personal communication, May 14, 2015).

**Significance of the Study**

While there is an abundant supply of literature recommending data usage for decision-making and HEI organizational culture, there is a visible gap in literature about integrating evidence-based decision-making and HEI culture. This study may be essential to the new movement in higher education as the aim to corporatize campuses is causing some change resistance. With the downfall of public support and state funding, HEI leadership is facing the reality that their campuses can no longer afford to run as “professional bureaucracies” (Kezar, 2012, p. 8). Thus, within the realm of uncertain budgets, campus leaders must begin to look for new ways to raise revenue, promote entrepreneurialism, and decrease costs (Kezar, 2012). Hence, the resistance to running HEIs differently reminds me of a quote I read at the Thomas Jefferson memorial in Washington DC, which stated: (Bernstein, 2004, p.219)

> I am not an advocate for frequent changes in laws and constitutions. However, laws and institutions must go hand in hand with the progress of the human mind. As that becomes more developed, more enlightened, as new discoveries are made, new truths discovered
and manners and opinions change, with the change of circumstances, institutions must advance also to keep pace with the times. We might as well require a man to wear still the coat which fitted him when a boy as civilized society to remain ever under the regimen of their barbarous ancestors.

Managing a higher education institution, the same manner it was managed 50 years ago, is like making a man wear a coat that fitted him when he was a boy. This study hopes to bring awareness to policy makers and leaders and promote a shift in paradigm and why there is a need for steady and continuous measurement of success to make quality decisions.

**Research Questions and Findings**

The study results indicated there is a relationship between the organizational culture of HEIs and use of data, but not essentially for decision-making. This research addressed the following primary questions:

1. Do HEI unique characteristics have an impact on using data for decision-making?
2. If yes, then which of the characteristics are most influential on data usage?

HEIs shared governance system, their interdependent nature, and their multiple power and authority structure were identified as the most influential in this relationship. Additionally, the study indicated that the most prevalent determinant leading to data use was the need for reporting. The significance of these findings relates to the university’s values, which exist in a hierarchy. As discussed earlier, teaching and research are positioned at the uppermost level of the hierarchy because without both, the university cannot succeed in its longstanding mission. This study affirms much of the existing literature that states that data is being used not to substantiate decisions to enrich a prescribed mission, but mostly used to show accountability.

**Discussion and Analysis**
The following sections dissect the above findings and provide analysis that led to two main themes. One has to do with understanding the landscape of decision making or the anatomy of decision making in HEIs. The second theme relates to systemic change in HEIs or the deficiency of systemic change and how the organizational culture of HEIs influences change or leads to the resistance to change. This theme reviews the three main factors that impact data use while providing a specific example on a policy initiated within the university system under review 62 years ago, with marginal success. In order to maintain the system’s anonymity, I used pseudo names for the initiatives and various related program titles.

**Anatomy of Decision Making**

As discussed in chapter two, data eventually transforms into some form of wisdom (Barabba, 2011). Depending on the viewing lens of the receiver, data is transformed first into information, which ultimately, leads to intelligence, which in turn, depending on the question or decision being addressed, leads to the wisdom to make a decision or a policy. Furthermore, there are three dimensions of decision making: (a) logical and analytical; (b) dialogue and collaboration; and (c) imagination and creativity, also referred to as intuition (Barabba, 2011). In higher education institutions, however, in addition to these three dimensions of decision-making theory, external forces and context of the decision seem to play a bigger role than others. Synthesizing the three dimensions of decision making and the ecology of HEIs has resulted in a complex understanding of the anatomy of decision making as depicted in Figure 5.1. The triangle in the diagram represents the actual decision, which comprises of the knowledge creation, knowledge dissemination, and knowledge application. Although the triangle or the actual decision is the core of the process, it is impacted by six elements or layers, before it can exist. The six elements include:
1. The viewing lens of the information provider
2. The viewing lens of the information receiver or the decision maker
3. The prevailing organizational culture
4. The prevailing organizational capabilities
5. The context or purpose of the decision
6. The external forces

Figure 5.1. Anatomy of Decision Making in Higher Education Institution

Evidently, in HEIs, decisions cannot be made in a vacuum; nevertheless, the entities listed in the outer layer of the diagram seem to make policy decisions in a vacuum. In other words, the decisions or requirements imposed on HEIs fail to consider the context, the prevailing organizational culture, the HEIs’ organizational capabilities, as well as the viewing lenses of the information provider and receiver. This is perhaps the most important lesson learned from this
study. With this understanding of the anatomy of decision making in HEIs, let us discuss each component of the diagram in more detail.

**The viewing lens of the information provider.** When raw data is analyzed by the information provider, (i.e., institutional research office); they tend to seek information depending on how they view the organization and believe the receiver needs to know. Their viewing lens, also referred to as perception, is perhaps the first and most important component in data use because how they see things, is how they will mine information from the data and report accordingly.

**The viewing lens of the information receiver or the decision maker.** The second most important component in decision making is how the decision maker perceives the situation. In the qualitative answers received in this study, one dean suggested that the decision makers sometimes influence the information provider’s viewing lens, or even request data manipulation. As discussed in chapter two Barabba (2011) refers to the third dimension of decision-making as imagination/creativity. Depending on how decision makers relate to themselves, they often use imagination and creativity with a touch of intuition to translate the provided information. Those with diverse experiences and viewpoints can be quite intuitive in generating the best possible solutions to solve important matters (Barabba, 2011). However, their perception about themselves, their organization, and the world, will play a major role on how they receive and interpret the information.

**The prevailing organizational culture.** Organizational culture refers to how the organization operates and views data. As discussed in chapter two, there are unique characteristics about HEIs that impact their culture. For instance, their “political yet consensus-oriented” (Kezar, 2001, p. 66) nature, combines collegiality and bureaucratic values which leads
to the existence of a political and yet an unclear structure. Another example of organizational feature which impacts decision making, is HEIs’ loosely coupled culture that leads to lack of synergy among HEI internal organizations which makes decision making process slow and prolonged. This means by the time a decision is made, the data used to make that decision may no longer be valid. Organizational culture relates to the change process; specifically, change processes can be thwarted by violating cultural norms or enhanced by culturally sensitive strategies (Bergquist, 1992).

The prevailing organizational capabilities. One of the comments received in the qualitative survey questions, referred to the information technology infrastructure capabilities. Decision making is impacted by the available tools, level of knowledge of the decision makers about data use, and other capabilities that somehow are forgotten about. A dilemma facing HEIs and this particular university system relates to the regional accrediting agencies requiring higher education institutions to demonstrate a culture of evidence-based decision-making. Yet, no guidance is provided on how to develop such a culture with the prevalence of multiple power and authority in HEIs.

The context or purpose of the decision. The next layer of the decision-making process is the context of which the decision is being made. Context has an over-arching implication on the decision. Some examples of these contexts include the purpose of the decision or what is the end result of it. For instance, is the decision being made to improve a program, resolve an existing issue, or maintain a current process? Most change processes miss the importance of organizational context (Kezar, 2012). Many authors have provided recipes for a linear change process; however, the process for HEIs is far too complex for a single approach to work within every situation and context (Burnes, 2011). For example, Kotter (1996) presents eight-stages for
creating change, which include creating a sense of urgency, developing a vision, developing coalitions, and identifying short-term wins. While helpful, his model focuses on the 70 percent failure rate of organizational change efforts (Kezar, 2012).

**The external forces.** Finally, the decisions are mostly, and as demonstrated by this study, are impacted by external requirements. The entities listed in the rectangle are what drive the use of data in higher education. The requirements from Federal, State, society, funding agencies, accreditation agencies, and Board of Directors have led HEIs to a culture of compliance, rather than a culture of evidence. Federal and state governments call for greater accountability and transparency from HEIs as a condition for their investment, requiring reports on various measures such as student completion rates. In the past, HEIs have enjoyed financial support with limited accountability to the public. Additionally, college affordability and access, particularly in states like California, where many students are being shut out of classes and institutions, has always been a concern. Increased public scrutiny calls for transparency and accountability for outcomes and a growing demand for using new means for assessment, which has caused university systems to react and make decisions on matters that require detailed scrutiny and academic involvement. On one hand, the lack of action taken by higher education leaders or institutions to address growing public concerns may result in a decline in funding. On the other hand, decisions to resolve issues are being made in haste, leading to long term additional funding needs. Thus, HEIs are in a difficult situation for which there is no quick fix or easy solution.

Understanding systemic change and/or lack of it due to the three HEI characteristics obtained from this research, will provides us with the insight to understand the decision-making process in higher education institutions discussed in the next section. My study results clearly direct us to a HEI’s tendency toward a culture of compliance, but in order to make the finding
more tangible, below I discuss each characteristic and provide an example of a decision made within this university system.

**Systemic Change**

The university system where I conducted my research is part of the state tripartite system, which originated at the turn of the 20th century from a reform movement. To culminate a long planning process for the future of higher education, the state developed a high-level plan in the 1960s to meet its projected increased enrollment demands and rising costs. One of the measures for this plan was the student graduation rate. Early on, after the plan was developed, the system realized that the graduation rate was not as successful as planned mainly due to the number of unprepared students entering the university system. Table 5.1 lists the chronological events that took place in order to address the unprepared student issue. After 29 years and millions of dollars spent, the effort to improve the readiness of the first-year students and the future workforce has not produced stellar results for the university system under review. With this background information about the first-year student remedial needs, let us delve into the findings of my research and attempt to connect each of the three characteristics influencing data use to the example discussed in table 5.1.

**Shared Governance.** The concept of shared governance within HEIs is historically referred to as the representation and influence of academic staff in various decision-making processes (Leach, 2008). In reality, shared governance is a term that is misunderstood by both the faculty and administrators in many HEIs (Olson, 2009). Some faculty believe that it means a committee votes on a new plan and it gets implemented. Some administrators believe that shared governance means that the professors delegate the governance of their universities to administrators (Olson, 2009). The deep misunderstanding of shared governance practice has led
### Table 5.1

**Sequence of Events to Remediate Graduation Rate**

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1977</td>
<td>Board of Directors mandated an English test for all incoming undergraduates.</td>
</tr>
<tr>
<td>1983</td>
<td>Board of Directors mandated a mathematics test for all incoming undergraduates.</td>
</tr>
<tr>
<td>1992</td>
<td>Board of Directors mandated an upgrade to mathematics test to include testing of three years of high school mathematics.</td>
</tr>
<tr>
<td>1996</td>
<td>Board of Directors adopt a policy to reduce the need for remediation in English and mathematics at the college level and set the policy goal that 90% of incoming first time freshmen should be fully proficient by 2007. This was the nation’s highest proficiency expectation.</td>
</tr>
<tr>
<td>1997</td>
<td>Board of Directors reaffirmed their commitment to determining competency in English and mathematics for entering students and to providing them with opportunities to develop necessary foundational skills. Consequently, another mandate was imposed on the 23 campuses. This mandate which is still in effect and requires that: (a) all nonexempt students take the English test and mathematics test examinations after admission and before enrollment at a campus; (b) all campuses place students who do not demonstrate the requisite competence in appropriate developmental/remedial education activities during their first term of enrollment and each subsequent term until such time as they demonstrate competence; and (c) all campuses establish and enforce limits on developmental/remedial activity and to advise students who are not making adequate progress in developing their foundational skills to enroll in other educational institutions as appropriate.</td>
</tr>
<tr>
<td>1998</td>
<td>Board of Directors adopt a new planning framework with no mention of the first-year student remediation.</td>
</tr>
<tr>
<td>2007</td>
<td>Board of Directors conducts a survey of all campuses regarding student remediation. Eight principles were derived at the end of the study for the board’s consideration.</td>
</tr>
<tr>
<td>2008</td>
<td>Survey of the campuses led to a new strategic plan to resolve the student success issue, which has guided the 23 universities in the system then. The plan aimed to (a) increase student access and success, (b) meet state needs for economic and civic development, through continued investment in applied research and addressing workforce and other societal needs, and (c) sustain institutional excellence through investments in faculty and staff, innovation in teaching, and increased involvement of undergraduates in their communities as well as in research.</td>
</tr>
<tr>
<td>2009</td>
<td>The system started utilizing an assessment program test, which provided high school juniors with an early signal to determine whether they were ready for college level math and English.</td>
</tr>
<tr>
<td>2010</td>
<td>Board of Directors mandated all 23 campuses to establish a program for incoming new students, who have not demonstrated proficiency in English and/or mathematics, to begin remediation prior to the term they have been admitted. The program start date was set to the summer of 2012 with full implementation by the summer of 2014. This meant that all students were required to achieve proficiency in English and/or mathematics on or before the end of their first year of enrollment on any of the campuses.</td>
</tr>
<tr>
<td>2014</td>
<td>The system chancellor announces that they would be expanding the existing student success strategies by 50 million dollars.</td>
</tr>
<tr>
<td>2015</td>
<td>Only 72 percent of entering freshmen, system wide, were proficient or ready for baccalaureate level work in both English and mathematics. This is 18 percent below the goal set in 1996 for 2007.</td>
</tr>
</tbody>
</table>
to an inherently oppositional relationship among administrators and faculty. The complex aspect of the term requires a delicate balance between faculty and administration in the decision-making process, while the administrators are ultimately accountable for the success of the university.

Furthermore, foundations, government agencies, national associations, accreditation agencies, and other stakeholders and groups are among the governing bodies that promote accountability. In the example mentioned above the Board of Directors with the noble intention to improve the graduation rate, while keeping access open to underprivileged, made decision after decision for 30 years without providing data as evidence or consulting the university faculty or administrators. In 2010, as mentioned in table 5.1, the Board of Directors in the university system under review, mandated all 23 campuses to establish a program for incoming new students who have not demonstrated proficiency in English and/or mathematics to begin remediation prior to the term they have been admitted. This meant that all students were required to achieve proficiency in English and/or mathematics on or before the end of their first year of enrollment on any of the campuses. Furthermore, Appendix F presents meeting minutes from November 2010, that clearly illustrates how the system’s Faculty Association expressed concerns about lack of evidence that the Board of Directors’ mandate will be effective. The minutes also illustrate how the campuses were asked to submit their first-year student remediation program proposal within two weeks. The example validates the prevalent perception that many academics conceive shared governance as non-productive and mostly a symbolic process (Leach, 2008).

Thus, without appropriate understanding and adequate education to all stakeholders, the term “shared governance” is not just another useless cliché, but also toxic to progress in higher education. Ruben (2004) introduced the Excellence in Higher Education as a facilitation tool for shared governance. In 2008, the university system in this study attempted to introduce and train
key stakeholders on this tool, where interpersonal relationships and trust are built among the various groups within HEIs during a decision-making process while fostering a feeling of ownership among all. The effort however was aborted due to budget cuts.

**Multiple Powers and Authority.** As discussed in the shared governance section, the decision-making process between faculty and administration is complicated, and then adding the Board of Directors, and the state legislatures to the mix, makes the decision-making process long, complicated, and as perceived by some administrators, unnecessary. In other words, if the final word in any decision is through the higher powers (i.e., Board of Directors), what is the purpose of collecting or analyzing data? The above example clearly demonstrates the hopelessness and helplessness of the decision-making process at the university system campus level. Perhaps the idea of involving the right stakeholders to the decision process early on and doing it right the first time is a novel idea to this university system. The process of remediating the unprepared students started in 1977. If the front line faculty and administrators were included in the discussions at that time, or data was collected via survey from the students attending the university; the solutions may have been different. Perhaps the burden of remediation would not even fall in the system, but on the upstream entities like high schools or middle schools. Unfortunately, many of the decision makers in this high level are politicians and not problem solvers. With understanding of how a HEI’s shared governance structure and its multiple powers system impact the use of data for decision-making, we can now address the HEI’s interdependent nature.

**Interdependent Nature.** As previously stated, higher education institutions rely on outside sources to survive. As the example above illustrates, they do not operate in a vacuum and are impacted by decisions made by other organizations internally and externally whether at the
local, regional, or national levels. With the significant growth through federal financial aid, state grants to students, and research funding the number of students have boosted. This has opened the forum for federal and state policymakers to get involved in the institutional operations, particularly those that deal with the taxpayers’ investments, such as student retention and completion. Even though there is no legislation on this influence, the extent of their involvement is dependent mostly on informal arrangements; however, with the current condition of HEIs, universities are competing for the same resources, causing the inclusion of various stakeholders in the HEI governance to become inevitable (Kezar, 2012). Use of data for decision-making is almost irrelevant if the data does not show what these multiple authorities and powers are looking for in order to fund the organization.

Further research did not provide any clues explaining how the investment strategies were formulated or what type of data the Board of Directors utilized to make this resource allocation decision. Another interesting finding for this case study was that students were not required to pass the remediation experience, but they were required to participate. A grade of No Credit, “NC”, would fulfill the requirement for those who attempt but do not pass the course. Again, it would be interesting to understand the decision process for this policy. As listed in table 5.1, after almost 30 years and many million dollars spent, the remediation program was still not successful, because as of fall of 2015, only 72 percent of entering freshmen, system-wide, were proficient or ready for baccalaureate level work in both English and mathematics. This was 18 percent below the goal set in 1996 for 2007.

The trickle effects of poor decisions impact many facets of our society. For instance, college affordability is a major concern among policymakers and impacts goals for access. Tuition has increased at approximately 6.3 percent annually for the last three decades
(Christensen et al., 2011) and tuition and fees raised by 274 percent from 1990 to 2009, faster than any other goods besides cigarettes (Kezar, 2012).

The example provided in Table 5.1 illustrates the HEI’s anatomy of decision making and how the decision process was ultimately impacted by the mandates from the external components. Unfortunately, university administrators are accountable to the boards and legislators, and as such are asked to make decisions and develop programs in haste to prove to taxpayers, their tax dollars are put to good use. Thus, such decisions lead to implementation of policies that not only affect millions of students, faculty, but also take many years and are costly to implement. Now that we understand the impact of the HEI characteristics of shared governance, multiple powers and authority, and independent nature effects on data use, we can address the implications for policy and discuss possibilities for future research.

**Implications for Policy and Future Research**

Organizational characteristics are aspects of an institution that relate to its performance, which may include its culture, goals, structure, and governance. There are several unique characteristics of HEIs that allows them to stay in business even when their leaders make the same mistake(s) over and over again. Among these characteristics that helps them stay afloat is their independence from business cycles and their institutional status. HEIs are independent from the market fluctuations, and tend to do well during economic down turns. The other characteristic, institutional status, allows HEIs to remain functional when their leadership decisions are not effective. Like hospitals and banks, society cannot afford to shut down a university. These two characteristics stand out in our discussion for policy implication because both characteristics tend to create a sense of complacency which removes the urgency for the need to improve. In this section, we will discuss the policy implication for much needed
organizational change or transformation, the implications on data, decision making, leadership and institutional research.

**Organizational Change**

This study challenged traditional ideas about the change process, while promoting an awareness of HEIs’ unique organizational culture and its impact on decision-making. When discussing organizational change, the hope is to adopt a culturally appropriate strategy when initiating, planning, and implementing change. Kezar (2012) asserts literature on change in higher education is not grounded in research, but has reached a point to help us understand the recurring issues such as high student failure rates and resistance. Additionally, because of their independence from the environment, and their institutional status, HEIs tend to adopt evolutionary change models (Kezar, 2001). HEIs are self-organizing systems (Wheatley, 2006) where they have a thermostat that redirects them to respond to certain needs. Even though this type of change creates a safe environment for the organization’s leaders; it is costly and time consuming to implement. Understandably, the change process for HEIs is long, but the policy implication for change can include thinking long term, rather than reacting to a legislature or accreditation requirement. The reactionary short term solutions have failed in the past, and as a matter of policy, should be avoided.

**Decision-Making**

In chapter two we discussed the elements of decision making and shared Barabba’s (2011) interactive decision model. There are several policy implications to consider in regards to decision making. For instance, many times in higher education institutions, the mindset of the enterprise is so fixed on what worked in the past that it is difficult to even understand a (new) systemic design. The linear thinking by some leaders in HEIs prevents this approach emerging
naturally. While the holistic approach to decision making is important, it is also vital to understand the assumptions made during the decision-making process. In the first-year remediation example discussed above, the Board of Directors made several key assumptions, which lead to several unsuccessful attempts to remedy the graduation rate. One of the key steps to making a decision, according to Barabba (2011), is to ensure all critical assumptions are shared and transparent. Another important policy implication is to understand all the various stakeholders who will be affected by the decision. In the example provided, the major impact was on faculty and administrators who had to carry out the ineffective mandates. Perhaps a future study can focus on analyzing the number of decisions made to date that did not involve all of the stakeholders and their effectiveness.

Data

Transforming HEIs from a culture of compliance to a culture of evidence requires a societal paradigm reframing. This study and the example case study demonstrated that decisions and data use in HEIs are usually prompted by external pressure. Baird (2006) asserts that HEI data have at least two quite distinct audiences, but, HEIs often confuse these two different data universes. One is the external constituency of the university with different expectations and purposes as to how data should be formatted and presented. The second and much more vital audience for data in HEIs is internal. These data should serve to drive the university’s behavior and be used as a decision tool to allocate resources that express the institution’s values. Additionally, the internal data is developed to defend universities against assaults on their effectiveness. Baird (2006) asserts that this is inappropriate, because the data is expressed in terms defined by “political context” and response to an attack, rather than in terms related to a HEI’s need for improvement.
Lombardi (2015, p. 102) in his book *How Universities Work*, shares an example of such instances:

The Institutional Research (IR) officer charged with providing data to the public finds himself, along with the PR officer, in a meeting in the president’s office. She demands, what is this table you want to release to the press? The IR officer says, it shows the change in research grants over the last five years. Yes, says the president, but it shows that we’re losing ground. The IR officer responds, Yes, that’s what the data show. The president says, you need to find a better measure than grants received, because we can’t show a decline. The IR officer thinks a bit and then says, Well, we can show an increase in the number of grant applications we’ve made to the National Science Foundation. Will that do? Yes, says the president, that’s good. The IR officer leaves to prepare the table, and the president turns to the PR officer and asks, what will the headline say? The PR officer writes it out and gives it to the president: University President Announces Growing Research Commitment: Research Grant Applications Rise as Faculty Compete with the Best in the Nation. Terrific, says the president. The trustees and alumni will love it.

What then can a university do about measurement? The university can begin by recognizing that in developing comparative institutional indicators, a few measurements generally are better than many. A few measurements will serve this purpose well, and little improvement in evaluation comes from adding additional, more complicated measures. (Lombardi, 2015, p. 102). The policy implication would involve a review of existing processes within HEIs. An adjustment to the current processes, which supports change and the emerging culture, is necessary and must be
disseminated effectively. Besides the audiences of data, other aspects of data use for decision making in higher education include data availability and delivery deadlines.

**Data availability.** Even though my study did not investigate the data availability on the campuses surveyed, it is crucial to understand simply having data does not lead to better decisions. When a blizzard of information is generated and provided to decision makers, it is difficult to review and categorize the data. It is important that the data be provided in a summary format. In order to make informed and quality decisions, data has to be turned into information and institutional knowledge through analysis and interpretation. Once the information is ready, it needs to be set in the context of institutional goals and finally disseminated in multiple formats that are appropriate to particular stakeholders (Leimer, 2012). In institutions like the higher educational system this study investigated, decisions are placed on hold until the requirements become urgent, at which point, the institutions are under pressure to make a decision for a major program in a few weeks without the appropriate research as illustrated in the case study above.

External and internal forces influence HEIs decision-making process. As depicted in Figure 5.1, the decision-making process is complex and HEIs need to address issues that are unique to their specific context. These contexts vary depending on the characteristics most prevalent on their campus with some decisions easier to initiate and implement than others. For example, due to HEIs’ financial dependence, revenue-generating decisions tend to be made and implemented quicker, such as increasing student fees or raising the parking fee (Kezar, 2012).

**Deadlines.** The bureaucracy involved in large higher education systems like the one under investigation in this study, in addition to constant turnover of administrators, leaves universities in a bind to provide reports quickly to external stakeholders. The content of these reports is also required to be favorable according to Lombardi (2015). Thus, the issue of deadline
and delivery becomes an issue for using data for decision-making. For instance, in the first-year student remediation case discussed above, campuses were asked to develop a long-term program and submit to the Board of Directors within two weeks (Appendix F). Thus, resistance to use data for decision-making stems from constant accountability demands with unfair timelines.

The decision-making process in HEIs, however, is a relatively slow process. One reason for this slow pace is the rapid turnover of academic administrators, which deflect the HEI’s “purpose constancy” and “consistency of execution” (Hellenbrand, 2014). Another reason is the academic’s involvement in the decision-making process. Finally, diminishing state support makes universities more subject to the agendas of outside funders. Lombardi (2015) asserts that HEIs will often publish rankings that demonstrate how well they do, even when they know the data is flawed, the methodology is unsound, and the results are unreliable. A reason for such deception, as discussed by Lombardi (2013) lies in the public’s limitless hunger for evidence of institutional distinction, causing universities to promote and distribute rankings of suspicious value, to meet that need. The self-promoting interest in HEIs by public universities is mostly out of fear of being scrutinized, and for private universities, the interest in HEIs lies in their ability to attract more students and private funding.

Leadership

Understanding the barriers that hinder effective decision-making and how resources are allocated is essential for policy makers. A more comprehensive study with mixed method is perhaps the next step to understanding why HEIs continue to operate in a state of inertia. I had the privilege to meet Dr. Adrianna Kezar in person on April 24, 2016 and discuss the topic of this study. Her recommendation was to expand the research and conduct interviews with the university system’s leadership, specifically the university’s presidents and vice presidents. She
believed that the questions needed to be drafted in a way that they will respond in a safe zone, rather than out of fear. Dr. Kezar believes that certain dogmas exist in higher education institutions which deal with informal and unspoken protocols and nuances, leading to actions where no one quite knows who initiated it. She used the hiring of adjunct faculty as an example. Her research indicates that there has never been an official memo or legislation requiring college deans or department chairs to hire adjunct professors, yet the majority assume that is what is expected. Dr. Kezar further advised an investigation of the following: fear of data and what it may really reveal, the pressure and amount of data available, the need for training leadership members to use data, and perhaps the need for education in systems and organizational learning. (A. J. Kezar, personal communication, April 24, 2016)

**Institutional Research Office**

The results in this study did not indicate that the IR office level of activity has an impact on data use. In a 1996 survey, 90 percent of college presidents said they wanted their IR offices to be proactive, but only half said that they were fulfilling this expectation (Leimer, 2012). Even though they are often under-utilized, IR offices can be a centralized unit where all components of institutional effectiveness can function from. HEIs have been creative on using IR offices as the guiding light for their institutional effectiveness. Leimer (2012) indicates that for whatever reason, IR offices have neither been assigned nor assumed a prominent role in cultural change, despite some senior administrators and faculty accreditation leaders stating that “more” IR is needed. HEIs increasingly rely on institutional research (IR) offices to document performance by providing data to external audiences. In fact, HEIs’ available funding stems mainly from some kind of reporting requirement (Leimer, 2012). Morest (2009) reports that motivating faculty and staff to take part in institutional transformation by supporting IR and using the report in their
daily practices is a major challenge facing many HEI administrators. Auburn (2008) indicates creative approaches are underway to utilize IR offices more productively. For instance, one research university has merged IR, learning outcomes assessment, program evaluation, decision support, and business intelligence into a single unit. Another undergraduate teaching university combined IR, learning outcomes assessment, strategic planning, accreditation, testing, program review, and university relations and communications under one department. Indiana University–Purdue University Indianapolis, has the oldest and best-known integrated unit where a new division is created and called Planning and Institutional Improvement. The function of this office includes: IR, information management, institutional planning, learning outcomes assessment, program review, economic modeling, and the testing center. Based on this trend, a policy implication would be to adopt a more integrated IR office.

Recommendations

In research and literature, discussing integration of data use and decision-making, particular attention is given toward barriers for change and critical success factors, mainly with a focus on organizational culture aspects. This study indicated that change is often initiated through external pressures, particularly when they are attached to funding sources. The anatomy of decision making in HEIs indicates, no matter how data oriented university administrators are, the external forces may mandate their choices. With the need for accountability and reporting requirements, oftentimes, the decision-making process is rushed to demonstrate accountability and greater responsiveness. Remaining truthful to data-based decision-making is difficult when leadership is under pressure for external accountability or when it is more important than internal academic issues. In the new structure, per Kezar (2012), the external voices have the upper hand over the internal voices. A transformation needs to occur, which requires a review of existing
processes, alteration of these current processes, and effective dissemination of related information.

This study suggests that HEIs are busy “looking” good rather than being good. Additionally, colleges and universities are filled with people who know how to conduct research, yet when it comes to making decisions, not much research is actually performed. To overcome some of the barriers in moving from a culture of compliance to a culture of evidence in higher education institutions, and to bolster continuous quality improvement efforts, leaders need to proactively implement strategies to overcome and understand the organizational goals and culture. Additionally, establishing new roles and careful consideration must be given to advocating use of evidence in decision-making. After conducting this research, the main recommendation I can make is for policy makers to fully understand the university’s business. Organizational purpose and business mission are rarely given adequate thought. With the main goals of the university in mind, which includes: (a) teaching and learning, (b) research, and (c) knowledge exchange (Godemann, et al., 2014), it will be difficult not to prioritize resources accordingly. With the goal of inducing quality decisions in HEIs, in this section, I will be discussing three recommendations, which include: (a) holistic view, (b) power of three, and (c) culture of learning.

**Holistic View**

Holistic view can be compared to systems thinking, where multiple components are connected to accomplish common goals. Deming (2000) asserted that the aim for any system should be that all components of the system improve and not just part of the system or at any other component’s expense. To be able to view educational systems in whole, rather than sum of components will allow the concept of shared governance to flourish. Viewing the educational
system as whole would require some boundary setting. Working to improve educational systems, where does the system end: in a classroom, a school, a school district, or the education system of a country? The focus should lie on the largest area of control; while working on system too large, with little control, would lead to frustration; starting from smaller systems is simply the starting point (Bellows, 2016)

Referring to the first-year student remediation example, if the policy makers had the goal in mind and had an appreciation for the system, they would have viewed the low graduation rate in terms of an up-stream issue rather than proposing a down-stream solution. Rather than allocating resources to the university system to address unprepared students, they should have directed them to the source(s) of the issue, where the base of students’ math and language skills are built. Understanding how all the connections and interactions are working together to accomplish a shared goal, the state could have achieved tremendous results early on, resulting in monetary and time savings.

**Power of Three**

Power of three is referring to Barabba’s three dimensions of decision making which include (a) logical and analytical, (b) dialogue and collaboration, and (c) imagination and creativity. In organizations, there are and will always be variations in available statistical data. In an attempt to improve, two mistakes could occur when looking at data; one was to treat a common cause for variance in quality as though it were a special cause, or to treat a special cause as though it were a common cause. Common cause variations are problems that are normally built into the system, such as defects, errors, mistakes, while special cause variations represent unique situations that are outside the system, such as a natural disaster (Deming Institute, 2016).
In the first-year student remediation case study, the meeting minutes (Appendix F) indicate no statistical, nor historical data was available the Board of Directors could use to make decisions at this grand level, nonetheless, understand the quality variations. Deming (2000) denounced blind management, where opinions are stressed for decision making, out of convenience, or ignorance. The state policy makers or Board of Directors or any other leaders sometimes use knowledge disavowal for decision-making. Barabba (2011) refers to this type of decision-making as avoiding the knowledge to maintain status quo or to avoid difficult choices. In addition to knowledge disavowal, decision makers avoid information for reasons related to its perceived lack of relevance, data availability in a timely manner, or cost of acquiring data.

Even though this study has placed much focus on improving the logical and analytical aspects of decision making, it is important to embrace the dialogue and collaboration aspect as well as imagination and creativity of the decision-making process. Because one of the characteristics that influences data use was HEIs’ interdependent nature, it is important to include dialogue and collaboration as a key aspect in the decision-making process. In the first-year student remediation example, it was apparent that if the policy makers had collaborated with all the various sources and included all stakeholder’s perspectives in the process, the decision would have been more successful. Additionally, the creativity aspect of decision making, is as important as the other two aspects. For instance, the Board of Directors could have used their imagination and brainstormed a better solution.

**Culture of Learning**

A third and most important recommendation for HEIs is to foster a culture of learning rather than a culture of compliance. In an organization that fosters a culture of learning, decision makers gain continual knowledge to make quality decisions. Organizational learning is the
process of creating and gaining knowledge, disseminating, sharing, and applying it to the decision-making process (Garcia-Morales et al., 2006). The main challenges learning organizations face include: internal politics, difficulty maintaining a good work / life balance, repeated mistakes, which is crucial for organizations to overcome (Senge, 2006). In a study, Koester, Hellenbrand, and Piper, (2008) provided an example of a higher education institution which attempted to become a learning organization. In 2003, California State University, Northridge (CSUN) undertook the challenge of becoming a learning-centered institution with the focus on student retention. The intention was to create a unified vision that binds this initiative with other important activities like the university's planning efforts and upcoming reaccreditation. The goals included increasing cross-functional and divisional collaboration; encouraging use of data as evidence in assessing progress; and overall transformation of the campus culture. CSUN’s leadership approach in accomplishing this culture change was to ensure that faculty and staff learned about learning and evidence. CSUN’s success in this effort was measured by the WASC accreditation report.

Deming (2000) believed that the learning cycle is achieved by planning, implementing, reviewing the outcomes, and modifying if needed; otherwise continue implementing as before. The idea is to learn from past experiences. This cycle is also known as plan, do, study, and act (PDSA). This continuous cycle leads to constant learning. This systematic review of decisions and programs, provide the decision makers with the knowledge on how their decision is performing and perhaps lead to needed modification of a programs. In the first-year student remediation case, discussed earlier in this chapter, even though there was baseline data to review the results against, the review process was not dynamic, agile, and timely. If HEIs want to improve their performance, they must measure their programs in a consistent and timely fashion
using key indicators and then track improvement. There is no substitute for this process (Lombardi, 2015).

Measurement of a decision success, does not equate to setting unrealistic numeric goals. When setting numerical goals without the holistic view is problematic because setting goals without providing the resources to carry out the goals on a timely manner is bound to fail (Deming, 2000). For instance, as illustrated in Table 5.1, in 1996 the Board of Directors adopt a policy to reduce the need for remediation in English and mathematics at the college level and set the policy goal that 90% of incoming first-year students should be fully proficient by 2007. This was a very ambitious goal and the nation’s highest proficiency expectation, yet resources were not allocated in a timely basis nor wisely to meet this goal. Thus, the goal was not achieved, yet another 50 million dollars was allotted to this unsuccessful program in 2014. A second issue with setting numerical goals relates to conflicting goals (Deming, 2000). As discussed in the first-year student remediation example, an ambitious goal was set while competing with another unrealistic goal to provide college access to all.

**Concluding Statement**

This study is about higher education from the perspective of organizational change management and, more specifically, it focuses on analyzing the HEI decision-making and their unique characteristics affecting this process. Making quality decisions is a complex progression in higher education institutions. A substantiated decision making process is important to make wise and quality decisions with HEI’s real mission in mind. There are cataleptic forces that influence decision making in HEIs, and these tacit powers tend to minimize the culture of safety that academics are accustomed to and where their creativity flourishes. Moreover, use of data for operational decision-making has been linked to the stigma of “corporatization” in higher
education institutions. The idea of becoming more accountable in academia, equates to demise of creativity, deduction of academic freedom, and surrendering the fundamental concepts of why HEIs exist. On one hand, HEIs have to compete with other institutions for funding, with potentially losing sight of their real mission. On the other hand, resources are limited for the quantity of output that is expected by society. Surely, there has to be a happy medium, where limited resources can be distributed fairly while not disturbing the creative ecology of the educational systems.

To stay abreast with the current economic and political environment, HEIs must become a learning organization. Learning perhaps is the only tool for HEIs to maintain their competitive advantage in the world. Applying organizational learning approaches as described by Senge (2006) is one of the most important instruments to transforming HEIs from a culture of compliance to a culture of evidence. In a keynote speech regarding implementing Deming’s system of profound knowledge in the education system at the Deming Institute 2014 Conference, Dr. Hellenbrand (2014) stated: “…This change, however, would require stalwart leadership; it would require uprooting a century of bad intellectual habits and misbegotten administrative structures”. I agree that a long period of unlearning is crucial, before HEIs can become learning organizations. I also believe HEIs rudimentary objective should shift from educating just their students, but also focus on educating the public on why supporting educational institutions’ mission will benefit everyone in the long run.

In conclusion, understanding why leaders do what they do, is still a mystery to me. Appreciating the path from data to wisdom requires us to be more accepting of human nature. As Saint-Exupery & woods (1943) say in The Little Prince: “It is far more difficult to judge oneself
than to judge others. If you succeed in judging yourself correctly, then you are truly a man of
wisdom.”.
References


Appendix A

For each of the sentences listed below, please check the appropriate answer that relates to YOUR PERCEPTION. If a sentence does not apply to you, please select “Don’t know”.

PLEASE NOTE: The term "data" in this survey does not just mean numerical or statistical. It could include narrative evaluations, work samples, as well as written and verbal reports.

Your Campus Characteristics and Use of Data for Decisions

1. I believe in my campus, decision-making power is shared among various departments.
   - Strongly disagree
   - Disagree
   - Agree
   - Strongly agree
   - Don't know

2. My campus is one of the best campuses in the system.
   - Strongly disagree
   - Disagree
   - Agree
   - Strongly agree
   - Don't know

3. My campus is clear about its mission.
   - Strongly disagree
   - Disagree
   - Agree
   - Strongly agree
   - Don't know

4. In my campus, several people need to approve any program or course changes.
   - Strongly disagree
   - Disagree
   - Agree
   - Strongly agree
   - Don't know
5. My campus values its status in the community.
   - Strongly disagree
   - Disagree
   - Agree
   - Strongly agree
   - Don't know

6. I believe the leadership in my campus works hard to communicate the University’s common goals.
   - Strongly disagree
   - Disagree
   - Agree
   - Strongly agree
   - Don't know

7. Campus leadership encourages me to evaluate my programs based on data.
   - Strongly disagree
   - Disagree
   - Agree
   - Strongly agree
   - Don't know

8. I am comfortable with analyzing data and drawing conclusions.
   - Strongly disagree
   - Disagree
   - Agree
   - Strongly agree
   - Don't know

9. My campus has a very active Institutional Research (IR) Office
   - Strongly disagree
   - Disagree
   - Agree
   - Strongly agree
   - Don't know
10. Overall, I believe my campus is decentralized.
   - Strongly disagree
   - Disagree
   - Agree
   - Strongly agree
   - Don't know

11. The leadership in my campus uses data to make major decisions.
   - Strongly disagree
   - Disagree
   - Agree
   - Strongly agree
   - Don't know

12. In my campus, I believe the faculty are committed to the vision and mission of the university.
   - Strongly disagree
   - Disagree
   - Agree
   - Strongly agree
   - Don't know

13. I believe in my campus, major decisions are made in a chaotic manner.
   - Strongly disagree
   - Disagree
   - Agree
   - Strongly agree
   - Don't know

14. I believe everyone in my college/department is aware of our campus’ common goal.
   - Strongly disagree
   - Disagree
   - Agree
   - Strongly agree
   - Don't know

15. My campus is politically charged.
16. I believe in my campus, data are used for reporting purposes only.
   - Strongly disagree
   - Disagree
   - Agree
   - Strongly agree
   - Don't know

17. I use data to evaluate my programs.
   - Strongly disagree
   - Disagree
   - Agree
   - Strongly agree
   - Don't know

18. I often use the reports I receive from IR to make decisions for my department.
   - Strongly disagree
   - Disagree
   - Agree
   - Strongly agree
   - Don't know

19. The leadership often uses data to substantiate a decision.
   - Strongly disagree
   - Disagree
   - Agree
   - Strongly agree
   - Don't know

20. I believe the departments in my college rely on one another to get work done.
   - Strongly disagree
21. The leadership in my campus has a deep understanding of data and its use.
   - Strongly disagree
   - Disagree
   - Agree
   - Strongly agree
   - Don't know

22. My college/department is concerned about the campus’ positive image and status.
   - Strongly disagree
   - Disagree
   - Agree
   - Strongly agree
   - Don't know

23. In my campus, I believe the staff is committed to the vision and mission of the university.
   - Strongly disagree
   - Disagree
   - Agree
   - Strongly agree
   - Don't know

24. I often review the reports I receive from IR.
   - Strongly disagree
   - Disagree
   - Agree
   - Strongly agree
   - Don't know

25. The leadership in my campus use data for reporting purposes only.
   - Strongly disagree
   - Disagree
26. The leadership in my campus often asks for dashboards to determine my college/department’s success.
   - Agree
   - Strongly agree
   - Don't know

27. I often contact my campus’ IR for information.
   - Strongly disagree
   - Disagree
   - Agree
   - Strongly agree
   - Don't know

28. I believe in my campus hunches and assumptions are valued for decision making.
   - Strongly disagree
   - Disagree
   - Agree
   - Strongly agree
   - Don't know

29. The IR in my campus provides very useful information.
   - Strongly disagree
   - Disagree
   - Agree
   - Strongly agree
   - Don't know

30. In my college, I believe tenured faculty are more committed to the mission and vision of the university than non-tenured.
   - Strongly disagree
31. The IR in my campus can be expanded to provide more useful data.
   o Strongly disagree
   o Disagree
   o Agree
   o Strongly agree
   o Don't know

32. The leadership in my campus rewards those who substantiate their decisions with data.
   o Strongly disagree
   o Disagree
   o Agree
   o Strongly agree
   o Don't know

33. I like working with data.
   o Strongly disagree
   o Disagree
   o Agree
   o Strongly agree
   o Don't know

34. I believe in my campus using data to make decisions is common.
   o Strongly disagree
   o Disagree
   o Agree
   o Strongly agree
   o Don't know

35. The IR office on my campus posts useful information on the website.
   o Strongly disagree
   o Disagree
36. What is the size of your campus relative * to other campuses?
   - Small - enrollment under 12,000
   - Medium - enrollment between 12,000 to 30,000
   - Large - enrollment over 30,000

37. How long have you been in your current position?
   - Under 5 years
   - 6–10 years
   - 11–15
   - 16+ years

38. How long have you worked on this campus?
   - Under 5 years
   - 6–10 years
   - 11–15
   - 16+ years
   - Other (please specify)

39. Select your discipline affiliation from the * drop down below:

40. Please feel free to comment below on important aspects of data use on your campus or college that have not been mentioned in this survey.
Hello;
I am a doctoral candidate at Eisner College of Education at California State University Northridge majoring in Educational Leadership and Policy. I am seeking your support in my dissertation research which focuses on understanding how data is utilized as a decision support tool at your college and campus in general. Your campus was randomly selected as one of the 12 campuses. Your input is valued because you and your Department Chairs are the administrative leaders and decision makers on your campus.

Would you please use the link below to complete the survey which will take no more than 10 minutes of your time. I am also asking that you please forward this email to your department Chairs OR provide me a list of their emails, so I can send directly.

Much attention was given to ensure the instrument provides confidentiality to the participants. Even though I know who receives this email invitation, I will not be aware of who has responded on SurveyMonkey, as there is no individual identifying information on the survey instrument such as name, email, address, and no codes linking back to identifiers will be created nor accessed.

The results of this research will be shared with you upon request. Please respond to this email requesting a copy of the analysis. The link below will remain open until March 23, 2016. Please note: completion of the survey; is implied consent to participate.

https://www.surveymonkey.com/r/xxxDATA

Kind regards;

Roxana Sayahzadeh Naraghi

Phone: 310-437-3389

Email: Roxana.naraghi.255@my.csun.edu
Appendix C
Reminder Email to College Deans

Dear Deans;

Do you ever wonder how and why decisions are made on your campus, or what substantiates them? Earlier this month, I sent a survey link to help me understand how campus characteristics relate to the leadership's inclination to use data for decision-making. 10 minutes of you and your Department Chairs' time is a worthwhile investment to find out. Besides, it will help me complete my research for my D.Ed. dissertation.

If you have already completed the survey and forwarded my email to your departments; THANK YOU!

If you have not, please use the link below to complete the survey and ask your department Chairs to do the same. I will be happy to share the results with you upon request. The survey closes on March 23rd.

https://www.surveymonkey.com/r/XXDATA

Please note: completion of the survey; is implied consent to participate.

Kind regards;

Roxana Sayahzadeh Naraghi

Phone: 310-437-3389

Email: Roxana.naraghi.255@my.csun.edu
Appendix D

EMAIL EXCHANGES BETWEEN DEANS AND RESEARCHER

1. I completed the survey but it has a lot of repetitive questions. I will not pass this on to the departments.

2. I am the Interim Dean of College of Education and Allied Studies at [blank]. I know from first-hand experience the many challenges of developing surveys. I understand your promises of confidentiality. However, I am not going to respond to your survey and I am not going to forward the email to my chairs. I think you are going to have difficulty getting responses from other people as well. There are many questions here that seem either unrelated, or remotely related, to how data is utilized on this campus. The survey is more of an evaluation of several aspects of our campus and college operations. It asks us to make judgments that are, in fact, an evaluation of the senior leadership of [blank]. Again, I understand, your pledge of confidentiality, but the questions are not appropriate for a dean to answer.

3. Please contact Dr. [blank] on our campus for the steps involved for research on our campus.
Appendix E

RESPONSES TO THE LAST SURVEY QUESTION

1. We have our own data person for our school. Our IR has improved over the last two years.

2. The questions in the survey were poorly framed and worded.

3. Our Dean provides excellent leadership and facilitates access to data.

4. Ensuring correct coding in the common management system, PeopleSoft, is a chronic problem and sometimes not easily fixed. Thus, the reliability of data, especially for the Education college, is always questioned. System level decisions have always affected (both positive and negative) use of the common management system. Again, for the Education College, there is no system level module for credential data...a work around was built, but is only in use on some campuses, not mine. It would seem hard for the system to respond to the teacher shortage if they don't have access to aggregable credential data!

5. Some of the questions were difficult to answer because some departments act very differently than does the college or university as a whole. Felt like I was sometimes comparing apples and oranges.

6. You should define faculty as tenure track or non-tenure track throughout the survey.. or right up front state it is only about tenure track... Part time faculty are non-invested in the institution and feel disenfranchised. They do not use data, nor are they involved in decisions.

7. The survey assumes that the IR office does many of the tasks of our College Assessment Office. I find it amazing that the IR Office on my campus does not have access to data such as student enrollment information. I've been told by the IR Office that it is an historical problem that involves a long standing VP who controls enrollment data.
8. Use of data is constantly emphasized, but key data that address the relationship between resource allocation and successful educational delivery are sometimes ignored and other data that are needed to qualify for major rankings or that would speak to student success from a long-term perspective (career outcomes rather than short-term metrics like retention and graduation rates) are not systematically collected. In short, we are becoming a data-driven culture, but some significant gaps remain before we will be gathering and using all the data relevant to long-term success.
Appendix F

MEETING MINUTE

Fiscal and Governmental Affairs (FGA) Committee

Meeting Minutes

Wednesday, November 3, 2010
10:00 a.m. - 4:00 p.m. - Coronado Room

Present: Darlene Yee-Melichar (Chair), Buckley Barrett (Vice-Chair), Edward Aguado, Michael Ault, Jim Meriwether, Dick Montanari, Catherine Nelson, Cezar Ornatowski, Praveen Soni

Guests: George Diehr (CalPERS Board of Administration); David Hood (ASCSU Budget Specialist), Thomas Krabacher (ASCSU Executive Committee Liaison), Craig Smith (Immediate Past Faculty Trustee); John Travis (CFA Liaison); Karen Zamarripa (AVC Advocacy and State Relations); Members of the Faculty Affairs Committee.

I. Call to Order: Chair Yee-Melichar called the meeting to order at 10:19am when a meeting quorum was attained.

II. Announcements and Updates: Chair Yee-Melichar made the following announcements:

☐ Update on Plenary Schedule. FGA meets 10am to 4pm (November 3), and 9am to 10am (November 4) if needed.
☐ Plenary Meets: 10am to 5pm (November 4), 9am to 3pm (November 5).
☐ Discussion of resolution for Academic Senate Budget (Discussion with Chair of Senate).
☐ Social Hosted by FGA for March 2011: Volunteers needed.

III. Campus Reports; Liaison Reports; Member Items

☐ Senator Yee-Melichar announced that the Chancellor has requested that campuses develop proposals for Early Start Programs by November 19, 2010.

IV. Consent Calendar

☐ Approval of October 15, 2010 meeting minutes with special thanks to Senator Ault.
November 4 and 5 to give ASCSU the opportunity to meet the bargaining team.

- CFA’s Action on Legislation and other
  a. Legislation: SB 330: Open the auxiliary and foundations to the CA public record act. Previously it was vetoed by the Governor. Amendments were included to protect the anonymity of donors but it was defeated. Senator Yee will re-introduce it.
  b. SB 1440: Amendment was added that stated transfer work from Community Colleges could not be considered upper-division.
  c. SB 1425: This bill tries to resolve several issues with state pensions. There were many issues that pertained to the CSU pensions, including FERP program.
  d. [Redacted] There are many concerns about this issue but the issue of under-represented groups in the CSU is important. The Board of Trustees is also concerned because they do not want to deny students. CFA’s concern is that no data has been provided by the Board of Trustees to demonstrate that this will be successful.
  e. Red Balloon Project: This is “deliverology lite” – it’s a top down process to bring technology into the classroom. It has the same attitude about shared governance as the Deliverology project.
  f. The Board of Trustee wishes to change the language of “student fees” to4 tuition.” Two concerns: first, changing the language is the “final straw” in divesting the CSU under the Master Plan. Second, fees have to go to education/instruction. “Tuition” goes into the General Fund of the Administration. This will make it more difficult to track where the money goes from the Chancellor’s Office. Also, student fees are set to go up 5 percent at the next BOT meeting and will most likely rise another 10 percent the following year. If this happens, student fees will have increased 242 percent since 2002.

- After lunch, John Travis held a Question and Answer session with the FGA committee.

4. Thomas Krabacher, Executive Committee Liaison and James Postna, ASCSU Chair (time certain: 1:00pm)
   - Discussion of Academic Senate Budget. Chair Postna reported that he too shares the concerns of the FGA committee resolution. However, he also asked the committee to consider re-working parts of the “prescriptive” elements of the resolution. Chair Postna then responded to questions and answers from the committee.

5. Karen Zamarripa, AVC Advocacy and State Relations (3:30pm)
   - Election 2010: Implications on budget front. “ongoing investments and initiatives on higher education are vulnerable because of turnover in the US House.” There was not substantial change in the assembly and