

DATA USAGE WITHIN HIGHER EDUCATION DEPARTMENTS:

AN IN-DEPTH CASE STUDY WITH ANALYSIS

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To Mike

While sometimes I felt like this was a very solitary journey, it wasn't. You were always there, right next to me. You fed me, let me sleep, made me get back to work, talked with me on the porch, left me alone to write, and read and re-read. You told me (and everybody else) how proud you were of me. I would not have wanted to do this without you. I do, with all my heart and soul, love you more! By the way, tell Frankie that he doesn't have to call me Dr. Mom, but tell the grandkids that Dr. Grandma does have a much nicer ring than Grandma J.

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With ever-increasing demands on higher education institutions to provide data for both accountability and improvement purposes, institutions have responded by establishing centralized institutional research (IR) offices to collect, maintain, and analyze institutional data. IR offices' primary responsibility is to respond to the external accountability demands and to the needs of the upper administration. However, it is at the department level where data may be directly used to make decisions that can lead to improvement in the quality of the programs.

Using a case study research design, this study provides an in-depth analysis of how five academic departments within one school used data by examining the Program Review process. Through an analysis of documents and interviews with those involved in the process, findings revealed that departments do use data for decision-making. This study found that the overwhelming majority of the data used is qualitative and comes from department, not institutional, sources. Two factors were found to affect the use of data. One factor is that data at the program level is not easily accessible. More importantly, it is not accurate and not trusted as a basis for decision-making. The second factor is that those involved in the Program Review process do not feel that the organization appropriately values the data or the process.

Recommendations are provided to address the influences of these factors. Recommendations regarding data include providing resources and establishing processes to improve accuracy and accessibility of data. Recommendations regarding organizational issues include improvements in the Program Review process and in the school's planning process. These recommendations are distinct, yet they are intertwined. Implementing one recommendation, without the other will not lead to changes in the use of data in this school.

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CHAPTER 1 – PURPOSE AND LITERATURE REVIEW

Introduction

Within higher education institutions, demands for data are being driven by two primary needs, the need for accountability and the need for improvement. Accountability demands are driven by the need to restore an erosion of the public trust between higher education institutions and the public (Leveille, 2006). Improvement builds on the data provided for accountability in an attempt to increase the overall quality of institution's performance (Ewell, 2008). What is becoming increasingly clear is that "gut feelings" or "because we have always done it that way" are no longer viable strategies to restore the public trust or to improve the quality of the institution.

A predominant characteristic of higher education institutions is that there are two separate and distinct hierarchies or silos – administrative and academic. Within administrative departments, the hierarchy is typically multi-level and these units operate more as a traditional bureaucracy. On the academic side, the hierarchy is much flatter and these units operate in a more collegial manner (Keeling, Underhile, & Wall, 2007; Kezar, 2001).

Higher education institutions have responded to accountability and improvement demands at the institutional level, in part, by creating institutional research (IR) offices with responsibilities for organizing, analyzing, and presenting data. Several studies provide substantial information on the types and uses of data produced by IR offices (Leimer, 2012; Morest, 2009; Posey & Pitter, 2012a). At the academic departmental level, there is little research on how accountability and improvement demands for data are being met.

In the U.S., accreditation is the primary process used to ensure quality to students and to the public (Eaton, 2015). Accreditation, at a department level, often uses a program review process to examine programs with an emphasis on quality and improvement (Pitter, 2007). The Program Review process, which typically includes a Self-Study, External Review report and a Program Response, is one

example of the data that are collected and presented at the departmental level. These reviews require extensive use of data but, as compared to the institution level, departments typically have fewer resources and less support available to collect and analyze data (Pitter, 2007).

One of the more widely studied uses of data within higher education institutions has been for decision-making, specifically for rational decision-making (Simon, 1979; Chaffee, 1983). However, given the unique characteristics of higher education institutions, there is evidence to suggest that rational decision-making may not occur within higher education (Borden & Kezar, 2012). While research has suggested other models of decision-making, there is also evidence that data may not be used for decision-making or may be used for other purposes, such as identifying problems or setting a context (Ewell, 1989). Other factors, relating to the data itself and organizational issues, may also influence the use of data.

Problem Statement

While there have been several studies of the use of data at the institutional level (Kerrigan & Jenkins, 2013; Posey & Pitter, 2012), less is known about how data are being used at a departmental level. A focus on the departmental level is important because this is the level where data can actually be used for improving programs and student outcomes (Burke & Minassians, 2002b; Kerrigan & Jenkins, 2013).

Research reported on influences on the use of data highlights possible concerns with data quality, data accessibility, and management practices (Ewell & Jones, 1994; Kerrigan & Jenkins, 2013; Leimer, 2012). While most of this research is also focused on the institutional level, there is little research, on either level, that focuses on the specific types, sources, and uses of data. A complicating aspect of the existing research is that the terms *data* and *information* are often used interchangeably, as are terms such as *data-driven*, *evidence-based*, and *performance reporting*. While similar in definition,

the distinctions in these definitions are important in understanding how data are used and how information is used and will be addressed in the review of literature.

Context of the Study

This applied study was conducted within one school at a large, public, Midwestern university. Literature was used to inform the study by providing the basis for understanding the context and by providing insights into possible areas for analysis.

The Program Review process, that provided the data for this study, are from five different programs within the Graduate School. For the university's campus accreditation, this school is required to perform Program Reviews on those programs that are not otherwise reviewed for accreditation. These Program Reviews have been completed based on guidelines developed by the University Graduate School and approved by the School's Policy Committee.

Purpose and Research Questions

The purpose of this study is to analyze how data are being used at the departmental level in one School of Education at a large public institution of higher education by examining five mandated Program Reviews through document analysis and interviews. The specific research question is, "what do mandated program reviews reveal about the types, sources, and uses of data in these academic departments within this large research university?"

Significance of the Study

The findings of this study provide a detailed understanding of what types of data are collected by these academic departments and how this data is being used. Specific recommendations have been developed to address the factors that were found to influence data usage. This increased understanding of data within these academic departments may also provide insights for other programs in similar circumstances.

Literature Review

The purpose of this study is to understand how data are used in this School of Education, specifically in the context of academic program reviews. This literature review will discuss some of the distinct characteristics of higher education institutions and academic departments and apply them to the context being studied. Then definitions of data - what it is, and how it may be used - will be examined. Demands for data and responses to these demands will be explored on both the institutional and departmental level. Finally, possible influences on the uses of data will be discussed.

Characteristics of Higher Education

Institutional characteristics. Higher education organizations are institutions with broad goals of teaching, research, and service and must respond to the needs and desires of multiple constituencies. Weick (1976) has characterized these institutions as being loosely coupled organizations where various parts of the system operate independently, are weakly tied to each other, and are slow to respond to one another. One example of this loose coupling is the separation of the roles of academic and administrative personnel. Two separate and distinct hierarchies exist within higher education institutions. A typical organizational chart for higher education institutions shows a flat decentralized structure on the academic side and a traditional, vertical, multiple level hierarchy on the administrative side. Within each of these hierarchies, the loose coupling results in limited sharing of information between units, often referred to as silos (Bess & Dee, 2008; Keeling et al., 2007; Kezar, 2001; Swenk, 1999).

Shared governance. Higher education institutions operate under a shared governance model that results in the sharing of authority and responsibility. While the ultimate authority rests with a Board of Trustees, the major decisions are shared between the faculty and the administrators. This concept of shared governance exacerbates the questions of who has what power and authority. Swenk (1999) describes the faculty as the highly educated, expert employees of a professional bureaucracy

who have the authority to decide major goals. Faculty have expert power and they value autonomy. Faculty also may have stronger connections to their discipline, both internal and external, than to the institution itself. On the other hand, administrators may be less skilled and less educated, and their authority is limited to deciding the means to achieve and measure those goals. Administrators have positional authority and they value control. Administrator's goals include the efficient running of the institution and are more accountable to others in the hierarchy and external policymakers. Students, who are not always included in these characterizations, have limited power, which is primarily exercised through their enrollment choices (Keeling et al., 2007; Kezar, 2001). Shared governance presents "issues regarding who should be involved in decisions, what information is relevant, and how it will be transmitted and interpreted at various levels in the organization, not just among those in senior positions" (Borden & Kezar, 2012, p. 88).

Culture. Another distinct characteristic of higher education institutions is that there are multiple cultures at work. Culture is defined as "a pattern of shared basic assumptions that a group has learned as it solved its problems of external adaptation and internal integration that has worked well enough to be considered valid and therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems" (Schein, 1992, p. 12). Bergquist (1992) defined four cultures of the academy. The collegial culture is primarily associated with the faculty, values autonomy, academic freedom, and scholarly work. The managerial culture values efficiency, accountability, planning and fiscal responsibility. The developmental culture values personal and professional growth of faculty, administrators, and students. The negotiating culture values equitable policies and procedures, interest groups, and power. All four cultures can be present at the same time and at the same place which may create paradoxes and tension, such as between the control desired in the managerial culture and the freedom desired in the collegial culture (Bergquist, 1992; Kezar, 2001).

These unique characteristics of higher education institutions provide background to understand the context and environment of this case study.

Characteristics of Academic Departments

Within this loosely coupled institution, academic departments are organized in specialized disciplines that each have unique cultures and values. Disciplines can affect concepts of teaching and learning, the mix of teaching and research, and teaching styles. For example, mathematicians stress logic and consistency of numbers, while art historians stress perspective and interpretation. It has also been suggested that humanities and social sciences faculty spend more time on teaching with more emphasis on general education than faculty in the hard sciences and technical disciplines (Kezar, 2001; Walvoord, Carey, Smith, Soled, Way & Zorn, 2000). In addition to differences between disciplines, loose coupling between academic and administrative departments results in high levels of autonomy for decision-making for departments and, more specifically, for the department chair.

Birnbaum (1988) suggests that there are three distinct and competing levels of organization within the institution. The technical level of teaching, research, and service is primarily the responsibility of faculty. The institution level, which must respond to external social forces and is the responsibility of presidents and boards, and the managerial or administrative level, which must mediate between the other two levels and find solutions to balance the often conflicting missions of faculty and boards.

The department chair functions at the nexus between the technical and administrative levels. Although they are involved in the daily operations where a majority of administrative decisions are made, department chairs are not typically trained in managerial or operational management. They act as mediators between the goals of the institution and the goals of the individual faculty members. In this role, the academic department chair includes both the administrative and academic functions, and they have to respond to the internal university and the external political environments. Chairs may

work on a continuum from a collegial team leader in a small or prestigious institution to more of an administrator in a larger, more bureaucratic institution (Posey & Pitter, 2012b; Walvoord et al., 2000).

In the loosely coupled, multi-cultured, higher education institution, the department chair is often caught in the middle with many demands, limited resources, and unclear goals and authority. The department chair often does not control the timeline of demands, threats, or opportunities that call for immediate action on their part. Although they may not know exactly what data they may need, they need data when they need it to make informed, data-driven, decisions (Kinnick, 1993; March, 1980; Seagren, Creswell, & Wheeler, 1993).

Within higher education institutions, this body of literature describes the role of the academic department chair which is the focus of this study.

Definition of Data

In recent years, there has been an increasing amount of research on the use of data in decision-making. Terms such as “data-driven”, “data-informed”, and “evidence-based” are used to describe how data may be used for decision-making (Cutting Edge Series, 2012; Kerrigan & Jenkins, 2013); Leimer 2012; Morest, 2009). In the literature, the terms *data*, *facts*, and *information* are often used interchangeably, but there are important distinctions. According to the Merriam-Webster Online Dictionary (2015), the definition of data is “facts or information used usually to calculate, analyze, or plan something”. However, the definition of fact is “a true piece of information” and the definition of information is “facts or details about a subject”. This circular definition highlights the confusion of the terms data, facts, and information.

The work of Ackoff, Jones, and others (Ackoff, 1989; Ewell, 2011; Jones, 1982) provides some clarification of and distinction between the terms, data and information. Data, which are most typically viewed as quantitative elements, are a result of observation or measurement. Data are facts from which some meaning can be constructed. Examples of data may include straight counts such as the

number of female students or the number of graduates in the English department. Information, which is more typically viewed as descriptive or qualitative, is the result of some relationship or interpretation of data within a specific context. “Information is created when data are selected, organized, and analytically manipulated, and the result is given a form that informs and serves the needs of users” (Jones, 1982, p.7). Examples of information may include a description in the change in graduation rates or a summary of survey responses (Ackoff, 1989; Bellinger, Castro, and Mills, 2004; Ewell, 2011; Jones, 1982). Another example of the distinction between data and information can be seen in approaches to organizational learning. Early approaches focused on acquiring, storing, and managing data. More recently, the focus has been on the use and interpretation of data, where information is constructed to enable the organization to learn by making meaning and sense of data and other formal observations (Borden & Kezar, 2012).

Given the conflicting or unclear use of the terms of data and information, it is important to understand the differences in the definitions of terms when trying to understand how data and information are used and what may influence their usage.

Classifications of Data

While data are typically classified as quantitative (numerical), information can be either quantitative or qualitative (Jones, 1982). Quantitative data may include demographics counts, such as student characteristics, or ratios, such as graduation rates. The most widely used presentation is trend data that displays data over successive time periods. Snapshot data present data at a specific point in time and may be aggregated at the program, school, and institution level. Data may also be presented as a relationship, such as benchmarking with other regional or national entities, or as a comparison to a goal (Burke & Minassians, 2002; Howard, 2001; Taylor, 2014). Another approach to classifying data and information is by the subject of the data, for example students, faculty, or financial. Subject

classifications can also be aggregated at the program or institution level and may be presented in a variety of formats (Leveille, 2006; Posey & Pitter, 2012b; Taylor, 2014).

These types of data may be collected and combined at the state and the federal level. State commissions for higher education provide reports for policy making such as college completion reports. Examples of agencies and initiatives that collect, disseminate, and report on combined institutional data at a multi-institution or federal level include National Center for Education Statistics (NCES), Integrated Postsecondary Data System (IPEDS), National Science Foundation (NSF), National Institutes for Health (NIH), and initiatives such as Achieving the Dream and the Voluntary System of Accountability (Gates Foundation, 2016; Fink & Muntz, 2012; Posey & Pitter, 2012b).

These classifications of data provided a starting point for the initial coding and analysis of the documents and interviews.

Uses of Data

Decision-making. In all organizations, the most prominent and widely discussed use of data is for decision-making. The belief that data are used to reduce the uncertainty in choosing among two or more proposed alternative courses of action is based on the model of rational decision-making (Ewell, 1989; McLaughlin & Howard, 2004). Simon (1979) states that rational decision-making is a process where once an issue has been identified, information will be collected, alternatives and consequences will be identified, and then a decision will be made based on the alternative that provides the greatest value for the least cost. However, Simon (1991) went on to state that rational decision-making is limited or “bounded”. The concept of bounded rationality acknowledges the facts that a) not all information can be obtained to develop alternatives and consequences, b) individuals have different values and beliefs, and c) individuals have constraints on their time and attention span when making decisions.

In addition to the rational model of decision-making, Chaffee (1983) identified additional models of decision-making within higher education and suggested that, in reality, elements from multiple

models may be used. The bureaucratic model is based on traditional administrative patterns where the decision is made by following procedures that have worked in the past. Political models are directed by self-interests with the decision being made through conflict resolution. The collegial model, which is based on consensus, is the model most closely associated with higher education decision-making, hence the name. A widely used model of decision-making, which is unique to higher education institutions, is Cohen, March and Olsen's (1972) "garbage can" model. This model is based on a view of institutions as organized anarchies, which are characterized by problematic or vague goals, unclear technology, and fluid participation in decision-making. The garbage can model states that in organized anarchies the mix of problems, solutions, and decision makers affects what and when decisions are made.

Within the different administrative and academic silos, different models may be more predominant. The collegial model is more predominant in the academic environment and the bureaucratic model is more predominant in the administrative environment. Other factors may also affect the use of models. Size or scale may also be a consideration with smaller organizational units using more collegial models and larger units using more rational or bureaucratic models (Ewell, 1989; Swenk, 1999; Walvoord et al., 2000). Given the low employee turnover in both type of organizational units, a political model based on competing interests is often prevalent in both administrative and academic decision-making (Kezar, 2001).

Within all organizations, including higher education institutions, decision-making occurs on different levels. Strategic decision-making processes guide the long term overall organizational direction and are done at higher levels of the organization. Strategic planning can be highly structured and follow a formal process or this type of planning can be episodic and driven by changes in external environment or changes in senior leadership. With broad goals and multiple cultures, these decisions tend to involve all levels and groups within the institution. Data for these activities include multiple input and productivity data, as well as special reports on internal and external issues.

Managerial or tactical decision-making processes guide the allocation of resources to achieve institutional goals. They involve a mid-range time frame and require adjustments to changing conditions. These decisions are more structured. For example, an institutional budget is typically developed on an annual basis with revisions based on availability, not need. Data used for budget development may include financial and demographic trend data from standard reports. It may also include ad hoc reports that analyze growing or contracting programs across departments.

Operational decision-making processes, such as registration or class scheduling are short-term and guide the day-to-day activities. They require less judgement because rules and policies are in place. These decisions are the most highly structured and narrowly focused. Data tend to be well defined and needed on a periodic basis in order to monitor efficiency and effectiveness (Howard, 2001; McLaughlin & McLaughlin, 1989).

Similar to the levels of decision-making, decision makers may have different philosophies. The primary concern of political decision-makers is others' perceptions. They use discrete focused information such as enrollment, and decisions are made based on relationships and influences that are often political and or situational. The primary concern of autocratic decision makers is a personal agenda such as the creation of a new research center. Autocratic decision makers prefer continuous information and may be interested in efficient processes rather than outcomes, which are already decided. Managerial decision makers' primary concern is on program quality such as efficiency and effectiveness of an academic department. Managerial decision makers typically use a rational model of decision-making that is often based on large quantities of data. The collegial decision-maker's primary concern is correctness of the process, and that all perspectives are heard (Chaffee, 1983; Howard, 2001).

Lack of use. While data are being requested and reported, there is evidence that these data are not being used for decision-making. (Ewell, 2011; Chaffee, 1983). "It is difficult to imagine an argument being made against data-driven decision making. It might sound something like, 'Let's ignore the

evidence and make our strategic decisions based on anecdotes and guesses.’ As ridiculous as that might sound, the fact is that many important decisions in higher education are made this way” (Ravishanker, 2011, p. 2).

Burke and Minassians (2002a) conducted a survey of legislative chairs of higher education commissions and directors of institutional research offices on their use of performance reporting. One of their findings was that all of the respondent groups claimed the performance reports have only a moderate effect in improving policymaking at the state and campus levels. Nearly a decade later, Kerrigan and Jenkins (2012) examined the use of student data at six community colleges with similar findings. They found that while the majority of faculty, administrators, and student services staff used data for decision-making, less than 50% believed their college used data “a lot” for planning. Leimer (2012) also reported a similar finding that two-thirds of college presidents said that their institutions are not particularly strong at using data for making decisions. A similar gap between collecting and using information was also a finding of a national survey of institutional practices in assessing student learning outcomes (Kuh & Ikenberry, 2009).

Depending on the decision to be made, there may be some important reasons for not using data driven or rational models of decision-making. For example, if the environment has changed dramatically, then the existing data may not be accurate or relevant in the current environment or there may not even be data available.

Chaffee (1983) and others have suggested that higher education institutions tend to use a political model of decision-making, rather than a rational model. In the political model, data is less relevant because the decision is made through conflict resolution based on conflicting self-interests and power (Chaffee, 1983; Howard, 2001). Decisions on budgets and funding are often made with a political philosophy of decision-making.

Additional uses of data. Given the characteristics of higher education, primarily vague goals and multiple means to the same ends, and the bounded limits on rational decision-making, Chaffee (1983) suggests that rational decision-making does not often occur in higher education institutions. Additional uses of information in higher education have been suggested by many (Chaffee, 1983; Ewell, 1989, 2011; Howard, 1989):

- Identifying problems is the use of data to indicate that a problem exists. Examples are typically descriptive information such as performance indicators and dashboards where information is used to highlight discrepancies with past results or expectations. In this usage, information does not contribute to decision-making, but is a starting point that a decision needs to be made.
- Setting context is the use of information to provide a broad context or background often for new initiatives or complex issues. This information can be used to define relationships with other parts of the organization. It is more holistic and comes from a wide range of internal and external sources and is less numeric and precise.
- Inducing action is the use of information to get people talking about a problem. It is often used in group settings to help focus the discussion. It is helpful in generating alternatives and identifying consequences. This information is often more concrete and can add value to discussions with people who have different values or different desired outcomes.
- Selling decisions is the use of information to accept or confirm a decision that has already been made. It is a symbol that the decision was made rationally and based on information (Feldman & March, 1981). It can be used to establish credibility in order to gain cooperation and support.

Perhaps the question becomes *how* data are being used, for decision-making or for others purposes, not *if* data are being used?

Uses of data is a primary question of this case study. This literature provides background on uses other than decision-making and is used in the coding of the interviews and Program Responses.

Demands for Data

It is widely acknowledged that within higher education institutions, external sources such as governments and private funding organizations are demanding data for accountability and quality assurance. Demands are driven by increasing costs, lack of perceived improvements, and ongoing concerns about the value of a college education resulting in an erosion of the public trust between the institutions and the public (Borden, 2011; Burke & Minassians, 2002a; Ewell, 2008; Leveille, 2006; Morest, 2009).

Accountability is but one of the demands for data in higher education. “Without being able to do something productive with the data, the collection and reporting of information becomes an abstract art, of little use to the institution or students” (Dziuban, Moskal, Cavanagh & Watts, 2012, p. 35). There are growing demands to use data to increase the quality of the institutions overall performance, with quality and performance lacking consistent definitions. (Borden, 2011; Ewell, 2008; Morest, 2007).

Using assessment as an example, Ewell (2008) suggested two paradigms that can provide insight into the demands for data. The improvement paradigm is directed internally toward improving teaching and learning, while the accountability paradigm is directed externally toward policymakers and the public. Assessment evidence under the improvement paradigm can be both quantitative and qualitative, while evidence under the accountability paradigm is almost exclusively quantitative.

Accountability. Leveille (2006) defines accountability as “a systematic method to assure stakeholders—educators, policymakers, and the public—that colleges and universities are producing desired results” (p. 162). Performance reports are seen as the preferred method for accountability reporting to fulfill requests from government, private funders, and accrediting organizations. Types of indicators on performance reports may include measures of inputs (resources), processes (means), outputs (quantity), and outcomes (quality) (Burke & Minassians, 2002a; Taylor, 2014). Accountability data are standard, comparative, quantitative measures that are used for summative purposes and are

communicated to external and internal stakeholders (Allen & Bresciani, 2003; Borden, 2011; Ewell, 2008). Examples of data for accountability purposes include reports submitted to IPEDS and the Common Data Set.

Improvement. Publishing performance reports may be seen as an end in itself, but it is only a necessary first step. For the purpose of improvement, accountability data are necessary, but not sufficient. It is the use of the data, deciding on meaning and implications that can lead to improving student outcomes and institutional performance (Burke & Minassians, 2002a; Leimer, 2012; Morest, 2007). Improvement data include quantitative and qualitative measures that are used for formative purposes to engage conversation within appropriate contexts (Borden, 2011; Ewell, 2008).

Benchmarking and trend analysis are two examples of how data can be arrayed to create information that can be used for decision-making (Burke & Minassians, 2002; Ewell, 2008). Business and learner analytics are also examples of data that can be used to improve operational and financial decision-making (Van Barneveld, Arnold, & Campbell, 2012).

Additional frameworks are being suggested that may broaden the demands for accountability and improvement data. Borden (2011) suggested an accountability framework that promotes both accountability and improvement, which includes measures of performance, transformation, and impacts. A recent report from the Gates Foundation (2016) identified a more comprehensive framework of metrics to attempt to answer the questions about whether and which colleges offer a quality education at an affordable price. This framework identifies performance, efficiency, and equity metrics related to access, progression, completions, cost, and post-college outcomes. However, there is work to be done on reaching consensus on the definitions of these metrics.

The distinctive characteristics of higher education institutions may cause tension between the demands of accountability and improvement. The vague goals of research, teaching, and service may create compatible and incompatible interests between resources devoted to scholarly activities and

student learning. In addition, the variety of stakeholders may also affect the use of data. Internal and external policy makers tend to prefer simple, straightforward information such as input and output measures, whereas faculty may prefer to use more qualitative information related to student learning and outcomes that they believe to be their responsibility (Borden, 2011; Borden & Kezar, 2012).

The distinctions between accountability and improvement demands provide a basis for understanding the uses of data, as well why different types of data may be used.

Institutional Responses to Demands for Data

Although the focus of this study is on departmental level use of data, departments do not exist in isolation from their institutions. Institutions shape the type of data collected, regulate access to the data, and shape the expectations for using data. Within higher education, one formal office most often associated with organizing, analyzing, and presenting data is the institutional research (IR) office. Titles of the IR office may also include terms such as institutional effectiveness, assessment, and planning. (Posey & Pitter, 2012a) With the increasing internal and external demands for data, it is not surprising that Leimer (2012) reported that the number of IR offices has increased more than 200% from 1995 to 2010.

Volkwein (2008) defines the nature of institutional research as a golden triangle that includes (1) institutional research and analysis; (2) planning and budgeting; and (3) assessment, effectiveness, and accreditation. IR responsibilities include data management and reporting, analytical reporting, planning and scanning, assessment, and accreditation (Leimer, 2012; Posey & Pitter, 2012a). Outputs of the IR office include standard reports that are produced on a regularly scheduled basis and are relatively consistent in format. Examples include factbooks, demographic profiles, and survey reports. In addition to standard reports, the IR office also produces ad-hoc reports based on current questions, issues, and needs. The outputs of the IR office have grown to also include more reporting and analysis in response

to increases in the demands for data for improvement (Borden & Kezar, 2012; Morest, 2009; Volkwein, 2008).

IR offices primary role is to respond to accountability demands such as external reporting and accreditation and then to respond to institutional leaders needs for data and information. As a result, based on limited resources, the IR office may not be able to respond to the demands of the departments in a timely manner. Therefore, departments may have their own processes and structures for collecting data and analyzing data to meet both accountability and improvement demands. Additionally, discrepancies may exist between the institution and the department in rules or definitions of data and information.

Departmental Responses to Demands for Data

Similar to institutions, departments are also subject to the external and internal demands for accountability and improvement. Differences may exist in the use of data, the roles that departmental personnel play, and the supports that may be available to collect and analyze data. While there is little research on the specific use of data with departments, Kerrigan and Jenkins (2013) surveyed six community colleges and found that departments used data for program planning, evaluation, long-term planning, budgeting, and identifying areas needing improvement. “Although college practices did not seem to significantly influence faculty and administrators, departmental practices did appear to influence faculty” (p. 24). Based on this relationship, initiatives that promote evidence-based decision-making may be more effective by focusing their efforts on deans and department heads. More importantly, it is the academic deans and department chairs who are directly responsible for campus performance (Burke & Minassians, 2002b).

McLaughlin and Howard’s (2004) discussion of roles in *People, Processes, and Managing Data* provide additional insights into the differences between data and information at the institutional level and the departmental level. In their Information Support Cycle, three roles are defined that cluster

responsibilities, tasks, and activities. The custodian role focuses on the integrity of the data. The broker role transforms the data into information. The manager role takes the information and applies it to the situation. At the institutional level, the custodian role may include institutional research (IR) offices as well as information technology (IT) offices. The custodian role at the departmental level may include accessing institutional data and maintaining department data that is not included in institutional systems. The manager role, at the departmental level, is usually predominant, but all roles may be evident. In smaller departments, the chair may perform all three roles. In larger departments, the roles may be more differentiated with an administrative assistant performing some custodian and some broker roles and the chair performing some broker and some manager roles. These distinctions between roles and levels may contribute to some of the concerns that departments may have. For example, if data from the custodian are simply handed to the manger, the manager may question the definitions of the data, especially if the data are not consistent with the manager's interpretations.

This literature on how institutions and departments respond to data demands provides background on the needs of departments and also provides insights into possible recommendations.

Influences on the Use of Data

The use of data is influenced by a combination of the characteristics of institution, the characteristics of the user, the characteristics of the process, and the characteristics of the data itself. (Ewell, 2011; Howard, 2001). While the majority of the literature discusses factors that may impede the use of data, there may also be factors that support the use of data or suggest ways in which the use of data can be improved. The two categories of factors that may facilitate or impede the use of data are issues with the data itself and organizational issues.

An underlying factor that may affect both data and organizational issues is treating data as information, which can create several obstacles and. One obstacle is that users of data may have a misperception that data reveals its meaning without interpretation and without regard to the context.

For example, if the data are positive, then something definitely worked. Another example of treating data as information is hiding or ignoring “bad-news” data. If the data are negative, such as poor program performance or learning outcomes, then something failed and users of data may be tempted to ignore the data, once again, without interpretation or without regard to the context. Treating data as if it speaks for itself or hiding bad news are examples where data are treated as information without the interpretation needed to turn data into information (Cutting Edge Series, 2012; Jones, 1982).

Data issues. Issues with the data itself are based on accessibility and trustworthiness. Acquiring the data may be more complicated than it may appear. Data may, or may not, be being collected and maintained, and the data may not be easily retrieved, manipulated, or presented in a way that is needed by the prospective user (Ewell & Jones, 1994; Ravishanker, 2011). Accessibility to data is defined as whether the data are available, and whether there is sufficient expertise to retrieve and manipulate the data. Initial concerns about accessibility centered on the lack of data being collected, or being stored in different formats (paper vs. electronic), or stored in different systems (Ewell & Jones, 1994; McLaughlin & Howard 2004). Evidence suggests that once improvements in collection and storing data have been made, data become more accessible, and there are more sources of data. This increased availability is attributed to more sources, better formatting, and the improved responsiveness of IR offices (Kerrigan & Jenkins, 2013; Leimer, 2012). The problem may now have changed from too little information to too much information.

Technical expertise or skills may also be an issue with accessibility of data. With larger, centralized, and more complex databases, locating needed data may require more skill than collecting and maintaining the data. While IR offices are producing more standard reports and search engines are becoming more powerful, users may not even know where to look to find relevant data. Effective institutional training, staff skilled in understanding and applying data have been identified as key factors

in an institutions successful use data. (Kerrigan & Jenkins, 2013; Leimer, 2012; Voorhees & Cooper, 2014).

Trustworthiness concerns may be expressed in terms of issues of accuracy, reliability, and validity. As Jones (1982) discussed, data and information have different properties that influence trustworthiness. Data issues are related to the technical aspects of measurement. Accuracy is the degree to which the measurements are error-free. Reliability is the degree to which the data can be depended on to be accurate and may be an issue when data definitions are not clear. Validity is the extent to which the measure represents the constructs. Validity may become an issue with the data collection process or analysis results such as response rates or confidence intervals in survey response. However, being able to provide accurate and reliable data is not sufficient for making good data-driven decisions. Consideration must be given to the properties of information which are based on the user and the context. Issues are whether the measure has face validity, in that it is relevant, acceptable, and timely (Ewell, 2011; Johnston & Kristovich, 2000; Jones, 1982; Morest, 2009).

Trustworthiness is often expressed as a concern when the data provided does not agree with someone's position or when it reflects negatively on a person or program (Ewell, 2011; Jones 1982). Kerrigan and Jenkins (2013) found that some of the barriers to faculty's use of data are that they do not trust the data, and that administrators and staff indicated that the available data are irrelevant to their responsibilities.

Organizational issues. Ewell (2011) says "The higher education environment also has some distinctive features that are likely to affect the manner in which those who inhabit it identify, collect, interpret, and display information" (p. 4). The organization characteristics and cultures of higher education institutions affect the use of information and are often at odds with the increasing demands for planning, accountability and with theories of rational decision-making. (Keeling et al., 2007; Kezar, 2001).

Faculty have strong values that specifically affect the use of data. While faculty value information or knowledge, they also believe that scholarship is never finished. This implies that most academics tend to seek more and more information and are reluctant to take action until all information has been collected. Faculty also tend to respect or value scholarly work more than administrative work and “tend to shun administrative work, instinctively” (Ewell, 2011, p. 5). Perhaps more significant than the values of faculty members, is the culture of the academic discipline of the faculty member. Faculty often tend to align more with their discipline than with their institution which may result in different departments understanding or interpreting data differently. Faculty or administrators from the hard sciences or engineering may tend to value quantitative data and analytical problem solving approaches. Those in the disciplines of history or literature may tend to value more qualitative data and holistic approaches to problem solving. (Ewell, 2011; Seagren et al., 1993).

An additional characteristic of the user of the data that is related to the academic discipline is the difference between those with a positivist perspective who may value factual data and those with a constructivist perspective who may value improvement or data that are more meaningful (Borden, 2011). Kinnick (1993) suggested further research in the differences in department chairs based on whether they were new or veteran chairs, interested in data, comfortable with technology, and assertiveness in seeking out new information.

The user of the data also has an influence on the use of data. If the one who is using the data is a higher-level administrator, then they may be more likely to use limited factual data because relevant data is not available or because there are political influences that must be addressed.. A lower-level manager who is concerned about the efficiency of a program may be more likely to use financial data to decide how to reduce costs or allocate resources (Howard, 2001).

The collegial culture, shared governance, and the increasing use of an organizational learning lens add additional influences to the use of data. Much of the work of the institution is done in

committees (Ewell 2011, Julius, Baldrige, & Pfeffer, 1999; Seagren, et al., 1993). Not only do these group experiences bring a variety of different disciplines and levels into the process, they create another layer of group dynamics. Group dynamics add elements such as forming group cohesion and developing communication patterns. A committee's use of data often starts with extended discussions on what the data means, with concerns about issues of trustworthiness. As Borden and Delaney (1998) suggested "nothing can divert the attention of a group away from a difficult issue faster than questionable data" (p.54). Committee members may have different abilities to interpret the data, different definitions of the data, and different definitions of the issues.

Factors that can facilitate or impeded the use of data formed part of the basis for the interview questions and for the analysis of uses.

Program Reviews

In the U.S., "accreditation is the primary means by which colleges and universities and programs assure quality to students and the public" (Eaton, 2015, p. 2). In addition to ensuring quality, the accreditation process also has roles in accessing government funding and engendering confidence in employers when evaluating applicants and providing tuition support. This process can take place on a university, department or a program level, with most universities using a combination of university-level and program-level processes (Eaton, 2015; Kuh & Ikenberry, 2009).

Although accreditation processes have evolved from displays of institutional performance to include assessment measures of student learning, they still largely support the external accountability demands and are usually facilitated by the IR office at the institutional level. At the department level, accreditation often requires a program review wherein academic programs are critically examined within a five to seven year period with an emphasis on program improvement (Pitter, 2007).

After the programs have been selected for review and the initial planning has been completed, the first step in the program review process typically includes a self-study. The self-study is developed

by faculty within the program and includes, but is not limited to, an overview of the program's mission and goals, curriculum and student outcomes, and descriptions of program processes and activities. Specific data may include student enrollment, degrees awarded, graduation and retention rates, and similar statistics. Information about academic personnel and their teaching, research, and service productivity may also be included.

The second step in the program review process is a site visit that is conducted by peer evaluators. Peer evaluators are respected members of the discipline under review and may be internal or external to the university or the program. Most often faculty and students are involved in the site visits. Several studies have noted the value to having external stakeholders, such as alumni, employers or community members involved in the site visit (Eaton, 2015; Palomba & Banta, 2011; Pitter, 2007).

The result of the site visit is a report that provides an overall assessment of the program's strengths and challenges, as well as providing specific recommendations or improvements. From this report, action plans and timelines are developed and presented to the administration (Pitter, 2007).

"Program reviews became widely used as quality assurance activities in the United States beginning in the 1970s. Since then, they have evolved as an essential component in demonstrating institutional effectiveness to accrediting bodies" (Pitter, 2007, p. 1). In addition to the accountability demands, Pitter (2007) conducted a study of the purposes of program reviews in 39 states and found that the purpose most frequently identified was "assessing and enhancing program quality" (p. 2). She also found that Program Reviews typically work best with a combination of quantitative and qualitative approaches and where faculty are part of a collegial decision-making environment. It should also be noted "that an important benefit of conducting program reviews is that the undertaking itself could be utilized as one of several initiatives to help move an institution from one set of characteristics to another. The process here is as important as the outcomes" (Pitter, 2007, p. 3)

This study examined Program Reviews that the University requires for those departments that are not participating in a regular accreditation review. The purpose of these reviews is more than fulfilling accountability demands. As stated in University policies, the purpose of program reviews “is to examine the quality of the academic program, assess the learning outcomes that are associated with the curriculum, and reflect on and plan for the future” (School of Education, 2012, p. 3). At this school, guidelines were developed by a faculty committee and were approved by the school’s Policy Committee. The guidelines include four phases.

1. Planning & orientation. The development of a review plan includes establishing a timeline and a budget.
2. Self-study. These materials include elements related to mission, curriculum, administration, faculty, resources, and future plans.
3. Site visits. An on-site visit with the internal review team and at least one external member, which includes a review of the self-study and possible interviews with other program faculty, staff, and students.
4. Reports and Action plans and follow-up. The report provides a summary of the programs strengths and challenges. Recommendations are provided for improvement or specific action. Follow-up reports may also be developed.

The Program Review process results in three documents – 1) Review Plan, 2) Self-Study, and 3) Final Report. The Program Review process and documents provide specific types of data such as admissions, demographics, financial support, degrees, and placement and may provide insights into how the data are used whether for decision-making, problem identification, context setting, inducing action, or selling decisions. In this study, the analysis started with a review of the Self-Study and then comparisons were made on how the data reported in the Self-Study are reflected in the Final Report.

The literature on the Program Reviews provided an understanding of how the process works and the types of documents that might be available for this study.

Theoretical Framework

Given that the purpose of this study is to understand how data are used in academic departments of higher education institutions, two bodies of existing literature framed this study. The first body of literature provides a framework for understanding the characteristics of higher education institutions and departments. The second body of literature provides a framework for exploring data, in its various forms and uses.

A large body of research exists to provide a framework for understanding higher education departments. At the institutional level, the characteristics of higher education are ones of vague goals and loose coupling within an environment of multiple cultures and shared governance. This combination of characteristics often creates organizations where there is tension between the different silos of the organization and there is often limited sharing and communication between these silos (Bess & Dee, 2008; Keeling et al., 2007; Kezar, 2001). Within the institution, academic departments are organized by specialized disciplines and have a great deal of autonomy. Chairs of academic departments act as a mediator between the institution's goals and the goals of the faculty (Kinnick, 1993; Seagren et al., 1993). This research on higher education institutions and academic departments provides a background for understanding some of the organizational factors that may influence the use of data (Ewell, 2011). The context of this study was limited to one academic department, which may reduce some of the organizational influences and may provide an opportunity to more closely focus on how data are used.

The frameworks for exploring data include understanding the definitions of data and the uses of data. Jones' (1982) provides a definition of data and differentiates data from information. Classification of data by form and subject may provide an additional way to understand data (Leveille, 2006). These

definitions were the basis for the initial coding and analysis and provided insights into data factors, such as accessibility and trustworthiness that may influence the use of data.

Based on external and internal demands for data, Ewell (2008) provides two paradigms to understand the uses of data – accountability and improvement. Within both of these paradigms, but more specifically in the improvement paradigm, there is an assumption that the data provided will result in decisions being made to take an action that will result in the improvement of the program and the institution. Simon's (1979) theory of rational decision-making states that data are used to analyze alternatives and consequences to decide on the most effective action to address the issue or problem at hand. However, there is evidence to suggest that rational decision-making does not often occur in higher education institutions and other models of decision-making, such as bureaucratic, political, collegial, have been developed. Evidence also suggests that data may not be used for decision-making and that there may be additional uses for data within higher education, which may, or may not, lead to improvement (Chaffee, 1983; Ewell, 1989).

The Program Review process, which includes a Self-Study and a Final Report, is one example of the use of data at the department level with the expressed purposes of accountability and improvement (Pitter, 2007). By conducting an in-depth analysis of multiple Program Reviews, a better and more completed understanding was developed that provided insights into what data are used and how this data are used within higher education departments.

Summary

The literature presented in this chapter provides a basis for this case study analysis. Characteristics of higher education institutions and academic departments provide an understanding of the environment and how these institutions respond to demands for data. Within this environment, the literature on definitions of types and uses of data provide a starting point for examining the Program

Reviews presented in this case study. Literature on the factors that influence the use of data provide further areas for analysis and possible recommendations.

CHAPTER 2 - METHODS

The purpose of this study is to describe and explore how academic departments within one school use data through an in-depth analysis of five mandated program reviews. This study began with an analysis of five completed Program Reviews documents. Interviews were then conducted with faculty, administrators, and staff who were involved in the Program Review process. The following question guided the study - What do mandated program reviews reveal about the types, sources, and uses of data in academic departments within this large research university?

Qualitative research is used when the purpose of the research is to develop a deeper understanding of a particular phenomenon, such as how data are used in higher education departments. Qualitative research can also address process-oriented questions, such as the use of data (Creswell, 2012; Merriam, 2009). This qualitative study was focused on understanding a specific issue by examining documents and conducting interviews. A purposeful sampling was used, and the data analysis was inductive and comparative. The findings are richly descriptive and identify themes or categories (Merriam, 2009). The following sections outline the research design and the process of the study and discuss the validity and the limitations of the study.

Research Design

According to Merriam (2009), a case study design is an appropriate method for the purposes of understanding and describing a particular issue. In this study, an in-depth case study design including five programs within one school was used to understand and describe the use of data within higher education departments. Specifically, this case study design included multiple cases and multiple data sources in order to more fully explore and understand the issues (Creswell, 2012).

Context of this Study

All case studies are bounded by the context of the study (Leedy & Ormrod, 2001; Merriam, 2009). This study was conducted within one school at a large, research university. Data for this study

came from five Program Reviews submitted to the school's Graduate Studies Office at the university's main campus. In the context of this study, the bounded system was the graduate programs that completed the Program Review process. The specific cases, or unit of analysis, consisted of five completed Program Reviews. To guide the Program Review process, guidelines were developed by the Graduate Studies Office, based on university guidelines and were approved by the policy committee. A summary of the Program Review process can be found in Appendix A.

Program Summary

For this study, five mandated, graduate-level, program reviews were analyzed. Three of the programs were doctorate level (90 credit hours) and two were masters' level (36 credit hours). Two of the program reviews were conducted in the 2013-2014 academic year and three program reviews in the 2014- 2015 academic year. While there were five programs, only three unique departments were reviewed. One department chair was also a program coordinator. Interviews were conducted with two department chairs, four program coordinators, two additional faculty members, and four people in administrative roles. All five programs provided a Self-Study and, at a minimum, a summary of the External Review. A summary of the programs and participants can be found in Appendix B.

Data Sources

Data for this study came from five completed program reviews and from fifteen semi-structured interviews. All data sources were stored and backed up in multiple secure locations.

Documents. In this study, Program Review documents include a Review Plan that outlines the review process that will be used, a Self-Study developed by the department personnel, and a Final Report that is based on an external review team's analysis of the Self-Study and site visit. An action plan or follow-up report was included, if presented. A review of these documents and discussions with appropriate administrators provided a list of possible interviewees and provided clarifying questions for the interviews.

Interviews. For this study, a semi-structured interview was conducted with those who participated in developing their Self-Study, in order to find out what is on people's minds and to check the accuracy of other impressions or findings (Fraenkel & Wallen, 2006). An interview protocol was developed to guide the interview (Appendix D). Several types of interview questions were used in this study. The interview began with background or demographic questions regarding the overall process and the interviewee's role in the process. Knowledge questions were used to verify or clarify data from the document analysis. Based on the specific research question, the interviewees were then asked experience, opinion, and feeling questions (Patton, 2002).

Participants

A purposeful sample was used to select interview participants in order to develop a deeper understanding from individuals who might be able to provide useful information (Creswell, 2012).

Participants from two groups were interviewed in this study. One group consisted of four administrators in the school. The goal of interviewing this group was to understand the overall purpose and processes of the program review and to identify any possible similarities or differences between the five completed reviews. The second group of interviews was conducted with the department chair, program faculty, administrators, and staff that participated in completing their Self-Study.

The Graduate Studies Office provided the names of the programs and corresponding department chairs that had completed a program review. Based on this list, an email was sent to department chairs to request access to their program review documents (Appendix C). After an initial review of the documents, an interview protocol was developed to ensure that similar information was gained from each of the completed Self-Studies. The interview protocol is provided in Appendix D (Bowen, 2009). IRB approval was obtained for these interviews. All participants received a solicitation email (Appendix E) and a study information sheet (Appendix F) that explained the purpose of the study, ensured anonymity and confidentiality, and requested a meeting.

Through interviews and email communication with the department chairs, the primary faculty that were involved in the program review were identified. The initial set of interviews was with the department chairs and program coordinators. As part of these interviews, these participants were asked to identify additional individuals who participated in the process. The second stage of interviews was conducted with those additional individuals, which included other faculty members and two administrative staff from two different departments.

Toward the end of the initial set of interviews, separate interviews were conducted with 1) the Associate Dean in order to understand the overall process and to review the initial findings and 2) three members of the technology services staff, in order to understand how data was provided to the programs for the Self-Study.

Data Analysis

The overall qualitative data analysis strategy was inductive, going from specific to broad, interpretive, and comparative. While the process outlined below may appear to be linear and straightforward, the process was iterative, moving back and forth, as more data were collected and simultaneous with analysis of the data. Analysis was conducted during the data collection process, as well as after all the data had been collected. Throughout the process, notes were kept in order to document the steps of the analysis and to identify possible codes and themes.

The steps in this case study data analysis included a document analysis and interviews for each individual program and then a comparison was done between programs. As themes were interpreted and synthesized, descriptions and findings were developed (Creswell, 2012; Leedy & Ormrod, 2001; Stake, 1995).

For each program, Program Review documents were obtained with the approval of the department chair. Each of the documents was reviewed and a matrix of types, sources, and uses was developed for each program. This analysis was based on the policy guidelines that were developed by

the Graduate Studies Office and supplied to each of the programs. A sample of the document analysis matrix is available in Appendix G. These matrixes formed the basis for the majority of the interview questions. All interviews were recorded and transcribed. A transcript was sent to all interviewees so that they could confirm the accuracy of the transcription and add any additional comments or clarifications. As a result of the interviews, the document analysis matrix was updated to confirm the initial findings and to obtain missing information, primarily about sources and uses. A profile of types, uses, and sources of data was then developed for each program.

In order to analyze the data across the different programs, a database was developed that included two primary tables - segments and uses. The segment table was related to types and sources of data and included unique instances of meaningful text from the documents and interview transcripts. These segments were coded as to the program, Self-Study component, and location (Review Plan, Self-Study, External Review, Responses, and interviews). Based on a review of the literature, segments were also coded based on type (data, information, qualitative, and quantitative), form (benchmarks, counts, snapshots, targets, trends, and text), subject (students, faculty, and financial) and source (department, databases, focus groups, surveys, and websites).

For example, this unique instance of text – “Well, there are only two of us and neither of us are a minority” was coded as Program = C, Self-Study component = Diversity, Location = interview, Type = quantitative, Form = text and counts, Subject = faculty, and Source = department. In another example, a graph of GRE scores for the last five years was coded as Program = B, Self-Study component = Recruitment, Location = Self-Study, Type = data and quantitative, Form = counts and trends, Subject = students, and Source = databases.

The uses table also included unique instances of text from the documents and interview transcripts. In addition to program and component codes, other codes were developed to identify the

use (challenge, issue, recommendation, response, strength, weakness) and whether any action had been taken.

For example, a recommendation to update the curriculum was coded as Program = D, Self-Study component = curriculum, Use = recommendation, and Action = in progress.

Both tables included fields labeled “other” and “comments”. These fields were analyzed separately to identify outliers, unexpected findings, and instances that were especially difficult to classify.

Detailed reports by program, types, sources, and uses were created. Summary reports, such as crosstabs of components and use, or types and sources were also created. These reports provided an opportunity to analyze both the individual programs and the specific research questions. Some reports were exported to Excel for further analysis and formatting, such as pivot tables and charts.

The analysis resulted in combining several of the initial sources into three categories (local, school databases, and newly collected). Due to a lack of evidence presented, several codes of forms (benchmarks, goals, and targets) were not pursued.

Validity

In order to ensure that the findings and interpretations are accurate, the findings must be validated. Creswell (2012) suggests three types of procedures to validate findings – triangulation, member checking, and external audits. In this study, triangulation and member checking were used to validate the findings. Triangulation is the process of comparing data from multiple sources to find evidence that supports the themes. This study triangulated 1) the examination of the documents with 2) the interviews of those in charge of the process with 3) the interviews of those who played other roles in the process. Member checking, which is the process of asking one or more participants to check the accuracy of the study, included the use of summarizing statements during the interview and a

transcript of each interview was sent to the interviewees asking them to confirm the accuracy or agreement with the summary (Creswell, 2012).

Summary

An in-depth case study method was used to understand the issue of how academic departments use data. This study was conducted within one school, within one university, by examining documents provided in five Program Reviews and by interviewing faculty and administrators that were involved in the process. The data analysis was conducted both within and between programs. Detailed documents of types, sources, and uses of data were created for each program. A database that contained unique segments of text from the documents and interview transcripts was created for comparisons between programs.

CHAPTER 3 – FINDINGS AND LIMITATIONS

The findings of this study are organized based on the research question; what are the types, sources, and uses of data as presented in the Program Review process? The data which was collected came from the Program Review documents (Review Plan, Self-Study, External Review report, Program Response) of five graduate programs within the School of Education and from interviews with administrators and faculty who were involved in the process. The following table shows the relationships between the elements of the research question and where the data that was collected.

Table 1

Summary of where the data was collected

	Types	Sources	Uses
Review Plan	Potential types presented	Potential sources identified	Challenges and issues identified
Self-Study	Types presented	Sources presented	
External Review			Recommendations provided
Interviews		New sources identified and confirmed sources from Self-Study	Actual and potential uses discussed
Program Response			Plans and decisions presented

Note. Blank cells indicated that no data was collected.

Types of Data

The review of the documents and interviews indicated that the Self-Study documents, which were prepared by the program faculty, was where the overwhelming majority of data was presented. The quantitative data which was presented was minimal and was similar in content in all five programs. The primary material presented in all of the documents was qualitative, descriptive text. As part of the analysis, each segment of the material presented was coded as either quantitative or qualitative.

Quantitative. Quantitative data were provided in all five of the Self-Study documents. Excluding the large appendices, which were actual survey responses or evaluations, a total of thirty-two unique instances of data were found across the five reviews. Thirteen of these instances were presented in the form of a table or chart. The remaining instances were presented in the form of text. Other possible presentation forms, such as a relationship to a target, goal, or benchmark were not found.

Examples of the quantitative data that were presented included tables of counts and demographics for admissions (applicants, admissions, entrants) over the previous five years. Tables of counts and demographics on graduation statistics were also provided by three programs. One program provided a line chart of applicants' GRE scores for the previous five years.

Text presentations ranged from one sentence: "The unit does not have a diverse faculty" (Program B) to one paragraph:

"Since 2000, 16 students completed our doctoral program: 12 Ph.D.; 2 Ed.D; and 2 transferred to the Educational Specialist program. Of those 16 students, 12 have positions teaching, 1 has a position in K-12, 1 has a position in higher education administration, and 2 have chosen not to actively seek employment. Since 2005, 5 students are ABD. Of the 5, 1 has a position in K-12, 1 has a position in museum education, 1 is an Associate Instructor, and 2 are unemployed" (Program C).

Quantitative data was also analyzed based on mandated components in the Self-Study. Data on students (applicants, current students, alumni) were provided in the Self-Study components of Enhancing Diversity, Recruitment / Yield, and Retention / Placement. Data on faculty were provided in the components of Enhancing Diversity and Advising / Mentoring. The components of Overview, Learning Outcomes, Professional Development, Quality Assessment, and Strategic Planning contained no quantitative data.

In the External Review reports there were two additional instances of data. One instance was a professional standard that is recommended for advising loads (Program D). The second instance was a statement regarding the number of credit hours of similar programs at other institutions (Program A). Based on the interviews, data on course evaluations and faculty activity reports were available, but not presented in the review process (Programs B and D).

Qualitative. Across all five Self-Studies, out of eighty-one total pages, seven pages contained quantitative material in the form of tables or charts. Therefore, approximately 90% of the total number of pages provided in the all of the Self-Studies were qualitative, descriptive text. As expected, all of the Self-Study components contained descriptive text. The subjects of the Self-Studies were primarily about the programs, rather than students or faculty, as seen in the components of Overview or Learning Outcomes. For example, four of the five programs presented descriptive text on the mission of the program. All five programs presented descriptive text on the programs' learning outcomes and program of study.

Descriptive text was found in the other documents that were collected as part of the process. The Review Plans discussed challenges for the programs and specific issues that they would like to be addressed. The External Review reports provided text when discussing strengths and opportunities, as well as recommendations.

Sources of Data

Sources of data are defined as the answer to the question, “where does the data originate from?” Through an analysis of the Self-Study documents and interviews, three sources of data and information were identified - local sources, school databases, and newly collected. Local sources included documents and records maintained by the department or the program, and individual faculty’s personal knowledge or observations. Depending on the size of the program and available administrative support, the local source ranged from department files on each student to one faculty member’s knowledge of the ethnicity of the small number of current students.

The school databases are initially populated from the institution’s data warehouse. When a student is admitted, the data from their application, such as name and address, along with information about the school to which they have been admitted are loaded into the institution’s data warehouse. The school then extracts the relevant data and loads it into the school database. When student data is updated, changes are made to the institution’s database and then reloaded to the school databases. To meet the needs of the school, additional data, such as fellowships and degree documents are included in the school database. The school database also has functions that allow school personnel to create their own reports.

Newly collected sources included surveys and focus groups with alumni and current students that were conducted for the specific purpose of the Program Review. One program conducted a full program review as part of a class project in program evaluation. Another program conducted a survey and focus group of current students and alumni.

The sources of quantitative data were from the school databases and local sources. Sources of information, both quantitative and qualitative, were found to come from all three sources.

Table 2 is a summary of the 167 coded segments of data and information classified by source and components identified in the Self-Study. It should be noted that segments may be counted in

multiple components. For example, a table of matriculates by year with demographic counts was coded in both the Recruitment / Yield and Enhancing Diversity components.

Table 2

Summary of sources by components of the Self-Study

Component	Local	School Databases	Newly Collected
Overview	17	0	6
Learning Outcomes	9	0	0
Enhancing Diversity	19	14	4
Recruitment / Yield	16	23	7
Curriculum	10	0	1
Advising / Mentoring	13	0	5
Prof Dev / AI Training	4	0	0
Resources	9	0	3
Quality Assurance	9	0	3
Strategic Planning	6	0	0
Retention / Placement	21	4	7
All	12	0	9
Total	145	41	45

Local sources. The local sources were the primary source of data and information for all of the Self-Study components. The Overview, Learning Outcomes, and Curriculum component descriptions came directly from department documents or websites. Department policies or procedures were also

presented in the components of Recruitment / Yield, Advising / Mentoring, Quality Assessment, and Strategic Planning. Since masters' students in this study were self-funded, there was no data or information provided for the two masters programs in the components of Resources and Professional Development. Other department sources mentioned were listservs, professional associations, and regional conferences.

Some departments also keep paper or electronic files of student information that may be a source for some other components, such as Resources. One department administrative staff indicated that she has complete papers files for all of the students (Program E). While a faculty member in a different program stated that "I have paper files from as far back as the 1970s. But they are not complete. It's hit or miss" (Program D).

Regarding the components of Enhancing Diversity, Recruitment / Yield, and Retention / Placement, individual faculty knowledge or observation was found to be the primary source for three of the programs. During the interviews, when asked about the source of the data provided on faculty diversity, one program coordinator explained:

"Yeah, that's something we could all do off the top of our head cause it's such a small faculty.

We know that we don't have any minorities. So that was just a matter of sitting down and listing" (Program B).

When asked about the source of placement data, the program coordinator explained a similar process.

"That's also based entirely on memory and, again, we don't have so many students that we can't do that. I believe that I sent around a list of the graduates in the last five years and said to faculty – 'if you know where this person ended up, fill it in' and I think, in all but 1 maybe 2, their faculty advisor knew where they were" (Program B).

A program coordinator from a different program explained placement data:

“We have so few students that we know who (the alums) are. And our graduates, they come to us. If they want to change jobs, we hear about it because they want a recommendation from us (Program C).

Regarding recruitment, one department chair stated “in the last few years I can tell you exactly who the admissions were because I’m the chair. And if I get a number like eight and I know we only admitted five, then there is something going on there” (Program E).

As one faculty member simply stated at the beginning of the interview after hearing the purpose of this study, “A database is our heads” (Program C).

School database sources. As expected, all of the Program Reviews presented some data that was obtained from the school database. This database combines institutional data that is often collected during the admissions process, such as ethnicity, gender, and test scores along with other data that is needed by the school. School specific data includes program codes and milestone completion documents and dates. Institutional data is provided at the school level and is not always directly available at the department, or more specifically, at the program level. Two programs also indicated that data was obtained from other school-based systems such as teacher certification files.

Examples of data that were provided from the school database included counts of the number of applicants or number of graduates along with demographics such as gender and ethnicity. One program also presented a breakdown of GRE scores over a five year period. This study found that all of the data presented from the school databases was student data. The interviews confirmed that data about faculty was obtained from department sources.

The raw data from the school database often had to be reviewed on a case by case basis to ensure the accuracy of the selected students. For example, several programs discussed a scenario where the question was asked – “How many students have been admitted in the last five years?” The results from the school database would indicate that there were ten admits. The program coordinator

or department chair would then say – “This can’t be right. We’ve only had three that I know of.” Then a list of the ten students from the database would be compared with other department records. The individual student review typically showed that one or more of the students had been coded in the wrong program. As one faculty member said “The data wasn’t difficult to find. The population was a little tough” (Program D).

Newly collected sources. All but one of the programs presented data and information that was obtained from surveys and focus groups of current students and alumni that were conducted for the purpose of the Program Review. The results of the following data collection procedures were presented in four Self-Studies. These Self-Studies presented results from the following data collection procedures:

- Focus group of 7 current students
- Focus group with an unreported number of students
- Survey of 12 alumni
- Survey of 14 alumni
- Survey of 38 current students
- Survey of 39 current students and 18 alumni
- Survey of 8 alumni and 3 doctoral candidates

The strengths and weaknesses of the program, as discussed by the students, provided information to inform all of the components. Specific discussions about why they chose to attend the program under review provided confirmation of statements about the reputation of the program and the value of recruitment activities. Student and alumni comments and responses also provided information on the quality of programs and their satisfaction with the curriculum and with advising / mentoring. Placement and diversity data was also provided, but the small number of responses may not be representative of the program under review. It should be noted that none of the programs had a formal process for collecting placement data.

As one program coordinator summarized – “while there was not much new information from the surveys, it is always good to have ‘the voice of the student’ ” (Program B).

Other sources. The Review Plan and the External Review report were also analyzed for sources. In the Review Plan, three of the programs indicated that a potential source of data could be from “discussions with faculty.” While some of those discussions may be captured from the local source, this may also be a source of much of the descriptive text in the Self-Study.

Two other potential data sources were mentioned, but not collected - survey and interview data from employers and employment data (where students received jobs, types of jobs/positions, success data such as promotion and tenure). Reasons presented for not collecting these data were a lack of resources (time and money) and doubts about the potential usefulness of the results. “I don’t think it would have been that helpful. We know. We hear from our peers and former students at other organizations that maybe say they are doing really well or maybe struggling, but there’s nothing we can do about it” (Program E).

The External Review provided some additional data on national standards and on credit hour and GPA requirements of other programs. More importantly, the External Review interpreted the data presented in the Self-Study and the data collected in the site visit. As such, the External Review report became an additional source of information for the program. While no external reviewers were interviewed for this study, they may be able to provide additional insights into how the data was interpreted and how the resulting information informed their report.

Uses of Data

While this study found few instances of data compared to what might have been expected, there is evidence in some of the final responses by the departments that the data reported in the Self-Studies were eventually used by those programs. While some operational actions were taken as a result, the primary use expressed by all the programs was that the External Review report confirmed

what was already known and also provided justification to the administration for program changes and funding requests that were already being implemented.

External review usage. The Program Review process facilitates the transformation of data into information. The first step in this process is the development of a Self-Study, which provides the majority of the data. The Self-Study is used to provide a context for the site visit from the external review team. The External Review team then uses this data, combined with on-site meetings to create a report. The report typically 1) confirms the Self-Study in the form of both identified strengths and issues and 2) provides some new information, often presented as opportunities and recommendations.

Opinions differed, even within the same program, as to whether or not the External Review provided new information. One department chair said, “As far as I know there is nothing here that was enlightening or new. Nothing that we didn’t already know that were issues or that we need to work on” (Program E). On the other hand, both faculty members indicated the report was very useful and there were several “ah ha” moments. From an administrator’s point of view, “I think the faculty have really embraced this and it carries a lot of weight. It has emerged that the external review is one of the most valuable parts of doing this for the faculty.”

While recommendations were provided primarily in three components – Curriculum, Recruitment / Yield, and Strategic Planning, a single recommendation may address several components. For example, the data shows that three of the five programs have issues with declining enrollment and that two of those programs also have only two full-time faculty. There is an obvious relationship between the number of students and the number of faculty. A program cannot support more students without more faculty and a program cannot get approval for more faculty if there are not enough students. As one of the faculty members explained:

“And so they began by, not only reading all the reports that we had, but by talking to us about ‘how could you market this to get your numbers up’. Our complaint was we can’t get our

numbers up because there's only 2 of us. How can we handle more (of a teaching load) than we've got now?" (Program C).

The External Review teams used the data to make several recommendations to address these issues:

- All programs had recommendations to increase or improve marketing efforts (A, B, C, D, E)
- Three programs had specific recommendations to hire additional faculty. (B, C, D)
- Two programs had recommendations to develop more hybrid or online classes. (A, C)
- Two programs had recommendations to develop a strategic plan and collect more data (B, C)

Program response usage. The final step in the program review process is for the program to respond to the report and identify specific actions to be taken. The program responses varied. Some operational decisions were made and actions were taken, such as creating a marketing committee, updating the website, changing admission process, and updating curriculum. Some decisions were also made *not* to do something that was recommended, such as changing the GPA requirement or changing the length of a program.

While not usually formally stated, the interviewees in all programs indicated that the use most often associated with the External Review report was confirmation and justification to the school administration.

"So maybe it was helpful in reminding people what we've already been thinking about" (Program A).

"I think it was more confirmation than new insights, but sometimes having data confirm what you already know is a good thing. Right?" (Program B).

"I don't know so much that they triggered thoughts, but let's just say they affirmed some thoughts that we had" (Program C).

"You know the experts from out of town have more weight than we do" (Program D).

“Yeah, but sometimes we, I may be speculating, need a force to tell the upper deans that we need another person” (Program E).

The department responses and interviews also suggested some reasons that the recommendations were not acted on. Constraints of time and resources were discussed as reasons why more online classes had not been developed or why new program approvals were not completed. Changes in the internal and external environment also limited some actions. External changes included changes in state laws regarding teacher certification and an overall decrease in high school graduates. Internal changes included personnel changes in the programs such as promotions and resignations.

About the Program Review Process

The Program Review process for this school required a Review Plan, a Self-Study, a site visit with written External Review report, and a Program Response (School of Education, 2012). All five programs provided a Self-Study and these reports ranged in length from nine pages to twenty-seven pages. Four of the five programs provided a Review Plan and an External Review report. Only two programs provided a Program Response.

When the interviewees were asked about the Program Review process, one department chair summed up the sentiments of most when she said “Well, #1 it’s a lot of work!” (Program A). Another program coordinator explained:

“So I would say that the cost / benefit or the amount of work and cost was nowhere close to the benefits derived from it” and then went on to say that “there is a mismatch between what you can collect data on and what you need to think about. And in this case, at the doctorate level, data is just not that useful for most of the things that we need to grapple with” (Program B).

While not seen as valuable by all, one program coordinator disagreed and said:

“Not only did we look at things and have feedback from our students and faculty, we had three outside evaluators come in and that’s a big thing because we had somebody without a vested

interest in the program give us some candid opinions about the program. That was very useful.

This self-study has become somewhat of a long range plan” (Program D).

As an administrator summarized, all of the reviews pointed out one or two new things and “everyone who has presented has said that it was helpful to go and talk to somebody about how we’ve used our review”.

Limitations

While this study provided insights into how data are used in in these specific academic departments, there are some limitations of this study. A limitation is that this study was conducted in one school, within one university, and all of the programs were graduate level programs.

Other limitations include the fact that not all of the personnel involved in these program reviews were available for interviews, but at least one person was interviewed from each program and the themes that emerged were consistent in the interviews that were conducted. Another limitation was that input was not collected from the external reviewers, who may have been able to provide additional insights into what was presented in their reports.

Future research

A useful follow-up study would be to conduct a similar case study of the same programs with the same questions, but from the point of view of the external reviewers. Since a second cycle of program reviews are planned, a similar study could be conducted during the next cycle. Another question that might provide insight is, “are department decisions that are clearly supported by data more likely to be implemented by the school than those that are not supported?”

An action research study might also be conducted in which changes in the use and value of data might be undertaken together with an examination of any resulting changes in the use of data for Program Reviews.

Summary

This study found that the majority of the data presented in the Program Review process was qualitative data in the form of descriptive text. The primary source of data was local or department sources. While department chairs did use data to inform decision-making, this study found that the External Review site visit and report was also a source of data that was used to confirm what the departments already knew and to provide justification of decisions to the administration.

CHAPTER 4 – DISCUSSION AND CONCLUSIONS

This study provides unique insights into types, sources, and uses of data because it presents a view from the department level. It should be noted that the programs in this study are graduate level masters' and doctorate programs. These programs may have characteristics and environments that are different than undergraduate level programs. However, there also may be similarities because of the overall characteristics of this higher education institution, the types of decisions that are made, and the data that is available to them. This discussion will use the existing literature to provide a basis to explore the types, sources, and uses of data from the department point of view. Factors that may influence these uses will also be discussed.

Characteristics of Higher Education

Weick (1976) suggests that higher education institutions have several unique characteristics. Higher education institutions are loosely coupled organizations where there is a separation of administrative and academic roles. The model of shared governance presents "issues regarding who should be involved in decisions, what information is relevant, and how it will be transmitted and interpreted at various levels in the organization, not just among those in senior positions" (Borden & Kezar, 2012, p. 88). And there are multiple cultures at work which may create paradoxes and tensions (Bergquist, 1992; Kezar, 2001). These characteristics also suggest that in addition to a rational model of decision-making, other models of decision-making are in play in higher education. Chaffee (1983) found that a collegial model of decision-making is more predominant in the academic environment and a bureaucratic model is more predominant in the administrative environment.

This study did find evidence of the unique characteristics of these institutions. The Program Review process at the department level was found to be a collegial process, with the departments defining their own purposes and issues as a basis for the review. At the school's administrative level, the decision-making model was found to be predominately top-down and bureaucratic. According to an

administrator in this school, planning and budgeting are handled at the dean level and individual programs are not included in this process. The finding that no program had a strategic plan document or a formal planning process is consistent with these characteristics. Also consistent is the finding that one of the primary uses of the Program Review process, specifically the External Review, was to inform or justify actions to the administration.

Department chair role. In the loosely coupled, multi-cultured, higher education institution, the department chair is often caught in the middle with many demands, limited resources, and unclear goals and authority. In this role, the academic department chair includes both the administrative and academic functions (Kinnick, 1993; Posey & Pitter, 2012b). They have to respond to accountability demands from internal and external stakeholders while also responding to improvement demands. Accountability demands are primarily operational. Improvement demands require more strategic decisions and actions. The conundrum is that department chairs are usually limited to operational decisions, but their strategic decisions may have more impact than decisions made by administrators because it is the academic deans and department chairs who are directly responsible for improvement (Burke & Minassians, 2002b). While accountability demands of external stakeholders may be satisfied by the presentation of data, improvement demands suggest the need for data-driven decision-making at an internal level, namely the department or program, where decisions can be made that improve student learning and student success.

This study found that department chairs and program coordinators do use data for decision-making. Specifically in their administrative role, they use data to respond to accountability demands, as seen in the Program Review process. In the Program Review process, data is used in the Self-Study to set context and identify problems for the external review visit. Chairs also ensure that data like admission, course evaluations, and faculty activity reports were properly collected. In their academic role, the Program Response provided evidence of decision-making. Some of these decisions, such as

creating a marketing committee or updating the curriculum are primarily operational, but may have some “strategic overtones”.

In this school, increasing enrollment is an issue for the school and therefore for the departments and programs. Using enrollment as an example, the data shows a decline in the number of students being admitted. The department chair has the authority to make operational decisions, such as updating the curriculum or creating a marketing committee, which may increase enrollment. Also at the department level, the chair can begin some strategic initiatives such as engaging faculty in discussions about the mission of the department or program, or the development of more online classes. However in order to fully implement these initiatives, the departments may need to hire new faculty or create new programs which are actions that are outside of the chair’s authority. At the department level, the data may support a decision to create a new program, but at the higher levels, this same data may not be sufficient to support the department chair’s recommendations.

Data-Driven Decision-Making

Inherent in the conversations about data-driven decision making is an implication that the decisions will be used for improvement. Simon (1979) states that rational decision-making is a process where once an issue has been identified, information will be collected, alternatives and consequences will be identified, and then a decision will be made based on the alternative that provides the greatest value for the least cost. Data is critical to this process in identifying an issue and in identifying alternatives and consequences. However, Simon (1991) went on to state that rational decision-making is limited or “bounded”. The concept of bounded rationality acknowledges the facts that a) not all information can be obtained to develop alternatives and consequences, b) individuals have different values and beliefs, and c) individuals have constraints on their time and attention span when making decisions.

This study found evidence that rational decision-making is bounded *primarily* by the fact that not all the information can be obtained. Values and time constraints were suggested only in limited ways either in the reports or the interviews.

Other Uses

All organizations, including higher education institutions, may use data and information for other purposes than decision-making. Ewell (2011) suggests that other uses of data are for identifying problems, setting context, inducing action and selling decisions. The model of rational decision-making and the Program Review process both provide examples of these additional uses. For decision-making, there is a sequence where data can be used to identify problems and set a context. Then, data can be used to induce actions or sell a decision. In the Program Review process, the Self-Study presents data to identify issues and set the context for the External Review visit. All of the Self-Studies included data on enrollment and identified challenges or issues that the program would like the reviewers to discuss. The External Review provides recommendations that may identify additional issues and attempts to induce action. The external reviewers of one program identified a specific student focus that was missing. Two of the external review reports discussed the need to address the lack of diversity in the faculty. The External Review report may also confirm decisions that have already been made. One report confirmed the need for new faculty and the need for an updated curriculum, both of which were already in process. The department provides the Program Response that identifies the decisions that have been made. One program decided not to change the recommendation to reduce the credit hours because of the possible impact on the quality of the program.

Influences on the use of data

Factors exist that may influence, either by facilitating, or by impeding, the use of data. Kerrigan and Jenkins (2013) found that two of the barriers to faculty's use of data are that faculty do not trust the data, and that administrators and staff indicated that the available data are irrelevant to their

responsibilities. Based on the interviews conducted for this study, some program coordinators are in agreement that the available data is not relevant for them, such as course evaluations or placement data. While some data may not be seen as relevant that may be because it is too general or different data is needed. An administrator and a faculty member provided similar examples of wanting different data in order to understand the implications of a program change. One asked: How do you know if students will actually enroll in this new program? The other asked: How will this change in admissions standards affect minority enrollment? Neither had access to data that would answer these questions. Changes in the external environment, such as unemployment rates or state certification laws may be seen by some as relevant and as irrelevant by others.

Data issues. One of the factors that can influence whether the data are used is issues with the data itself, specifically accessibility and trustworthiness. Accessibility to data is defined as whether the data are available, and whether there is sufficient expertise to retrieve and manipulate the data (Ewell & Jones, 1994; McLaughlin & Howard, 2004). Trustworthiness concerns are defined as issues of accuracy, reliability, and validity (Ewell, 2011; Jones, 1982).

This study found that there were issues of accessibility to program level data. The need for, and the creation of, a school database which is separate from institutional databases provides evidence of a lack of accessibility. At this institution, there are campus level institutional research offices whose functions are to organize, analyze, and present institutional data. These offices were initially created to respond to accountability demands, but are now growing to provide more analysis and reporting to address improvement demands. This campus is currently implementing a new Decision Support Initiative that may provide improved reporting features, as well as access to program levels of data. However, unless and until, the issues with the trustworthiness of the data are addressed, the issues of accessibility are not significant.

This study also found issues with the trustworthiness of the data. As noted in the findings, the accuracy of the data from the school databases was often questioned. Errors in the initial collection of the data and the processes for updating and maintaining the data both led to these concerns. Coding errors were found in both the school database and the institutional databases that provide input to the school databases. Work has been done to correct these errors, but there was no evidence provided on any new processes to ensure that the data continues to be maintained. In addition to errors in coding, another example highlights potential problems with validity, or the extent to which the measure represents the constructs. As an administrative staff member described:

“But let’s say that we want to look at geographic diversity to see if we are getting people from all over the country or just from the Midwest and how does that compare with other programs. So you have home address, mailing address, state of residence (which is often Indiana, because of tuition purposes). Then you have people coming from graduate programs that say they are coming from Virginia, but they may have spent their whole life before that in Illinois.”

Another concern with the accuracy of the data is based on the source of the data. Department statements about the sources such as “that’s based on memory” (Program B) or “it’s something that we can just do off the top of our heads” (Program E) are not considered reliable. While the data from these sources may be accurate, perhaps even more concerning was one faculty members comment: “When reporting on some of that lost information, you just have to be generic and just . . . guess” (Program D).

Data verses information. Data are facts, based on observation or measurement, from which some meaning can be constructed. Data are not useful in isolation. Data can only be used when it is interpreted within a specific context and for a specific user, transforming it into information.

“Information is created when data are selected, organized, and analytically manipulated, and the result is given a form that informs and serves the needs of users” (Jones, 1982, p.7). While there is not a straight line between data and uses, as there may be in decision-making, if data is trustworthy and

accessible, it can be transformed into information which can be used for decision-making or other uses. Information that is not derived from data, is inherently unreliable (Jones, 1982) or subjective. This distinction between data and information is important because if information is based on incorrect data then the interpretation may, or may not, be accurate. For example, if a decision is based on an increasing percentage of students, then there needs to be agreement on the definitions of the numerator and the denominator. Is the denominator, the number of students, defined as headcount or defined as FTE? For resource planning, the headcount definition is more important. For financial discussions, the FTE definition may be more important. Also if one of the numbers is inaccurate, then the percentage is inaccurate, and any decisions or actions based on this information may not have the desired or intended results.

Organizational issues. Since this study was limited to one school within one university, organizational factors such as the characteristics of the institution and the characteristics of the academic discipline were not a relevant area for analysis. However, organizational factors such as the approach to decision-making and culture of the school were found to affect the use of data.

The bureaucratic model of decision-making in this school led one program coordinator to explain “for the most part all of those recommendations have been, not ignored, just forgotten because there is just no follow-up” (Program B). “When an information-based mode of thinking and working is part of the culture, people reflexively ask questions and search for relevant data before deciding on a new program or developing initiatives. They routinely evaluate learning, processes, and progress toward goals to determine whether the programs and initiatives are achieving the desired outcomes. In such a culture, reflecting on practice and asking ‘how do we know?’ is standard fare” (Leimer, 2012, p.45). If this type of cultural change were to occur, then data would be used for decision-making that is both operational and strategic.

In *People, Processes, and Managing Data*, McLaughlin and Howard (2004) define three key roles with respect to the use of data. The custodian role focuses on the integrity of the data. The broker role transforms the data into information. The manager role takes the information and applies it to the situation. In this study the custodian role is filled by the office that maintains the school databases. As an administrator explained:

“We are just curating the data. When we find it out... For example, this department runs a report and they say ‘this isn’t right’ and they call us. We tell them then ‘this is what you need to correct’ ”.

The manager role is filled by the department chair. For example, an administrator explained that there was an expectation that the department chair is responsible for coming to the Graduate Studies Committee and interpreting the results of the Program Review in the context of their specific program.

The broker is the role that appears to be absent. As the administrator suggested:

“If we had a professional data position in the school from a strategy perspective we would be doing these things. And the reason that we are not doing these things is because we don’t have a person. What would anybody base strategic planning on?”

Borden and Delaney (1998) explain the broker role somewhat differently as an institutional research professional who, with knowledge of administrative and organizational issues and with access to internal and external information, can help users understand their needs and then provide data to help them make a decision.

Summary

The influences of data factors and organizational factors can either facilitate or impede the use of data. This study found that in this school both factors present barriers to the use of data. Although the data used by department chairs is considered accurate, it is based on sources that are unreliable. Moreover, the department chairs do not feel that the institution places value on this data or on the

Program Review process. The relationships between data and organizational influences on the use of data are displayed in the table below.

Table 3

Relationships between influences and uses of data

		Data is accurate and trustworthy	
		Low	High
Organization supports and values data	High	Data are used and can lead to unexpected consequences	Data are used and can lead to significant improvement
	Low	Data is not and should not be used	Data may not be used and opportunities may be ignored

These influences are not separate and distinct - both must be addressed together to improve the use of data. An organization should not use data if it is not accurate and trustworthy. An organization will not expend resources to improve the data if it is not believed to be valuable. At the department level, even data that are accurate and trustworthy will not be used if the data are not valued by the organization.

Conclusions

Within these academic departments in this School of Education, department chairs use data for both accountability and improvement purposes, but quantitative and qualitative types of data are used for different purposes. Data factors and organizational factors that influence the use of data were found to impede the use of data more than to facilitate its use.

This analysis of the Program Review documents and processes revealed limited evidence of quantitative data, which was used predominantly for accountability purposes. The majority of the materials presented contained qualitative descriptive text. Department chairs use data for operational decision-making and have limited authority to make strategic decisions that can lead to improvement. In addition to decision-making, department chairs use data to identify problems and to set a context for those outside of the department.

Although one might have expected the primary source of the data to be institutional databases, this study found that the majority of data came from within the department. The personal knowledge of faculty was found to be the primary source of local data because the institutional data were often found to be inaccurate. Therefore, the data was not trusted.

Two primary factors were found to impede the use of data. One factor was issues or concerns with the accuracy and trustworthiness of the data. The second factor was organizational issues and included how the departments perceive that the school administration values data, specifically the results of the Program Review process.

Specific recommendations are made to address the influence of these factors.

1. Establish a centralized function that is responsible for ensuring the accuracy of the data, and developing processes to maintain the data. A broker position, one who understands the nuances of the data and can produce effective reports, should be part of this function. The services currently available from the campus' institutional research

office and from the school's technology services office should not duplicate efforts, but could be combined or enhanced. Efforts should also be made to work with other offices to collect additional data such as the placement of graduates.

2. Develop a school-wide approach to using the results of the Program Review process for improvement. The guidelines for the process should be reviewed, and more oversight is needed in the documents are submitted. Program responses and annual follow-ups on progress toward goals should be required. Departmental strategic plans that are aligned with the school's strategic plan should be developed and not limited to budgetary discussions.

A suggested first step would be to develop a process to maintain the databases and establish an office who has both the responsibility and the authority to recommend policies. The creation of this office would also be a first step in acknowledging the value and future uses of data. While work has been done to clean up the current school database, without implementing these recommendations, no new technology can fulfill the stated purpose of the Program Reviews to increase the quality of the academic programs.

The findings of this study suggest that improvements could be made in the use of data by developing additional resources, both peoples and processes that maintain accurate data and that can provide additional data. Findings also suggest the need for resources that support the transformation of data into information that can be used by the institution and the department to fulfill the stated purpose of examining the quality of the academic programs.

If higher education institutions are to respond to accountability demands, the data must be accurate and trustworthy. If the institutions and department chairs are to respond to improvement demands, data must be valued by the organization, and department chairs must have authority to make operational decisions and be involved in the planning process.

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Appendices

Appendix A

Program Review Process

The current version of the Program Review process started in 2013, but a previous process was in place several years before. Program Reviews were mandated by the University Graduate School (USG) as part of the campus accreditation process, which requires that all programs that were not otherwise accredited needed to complete a Program Review. A faculty committee developed the guidelines and process based on research on other program reviews at similar institutions and on the campus-wide guideline. These program review guidelines were then approved by the school's Policy Council. Each program has the flexibility to design a program review that is consistent with their area of study and addresses specific program issues. The Program Review process includes a Review Plan and a Self-Study prepared by the program, a site visit which results in an External Review report, and then a Program response.

An initial five-year calendar was developed. The calendar was based on starting with the programs that had not been reviewed or newer programs, and attempting not to overload any one department. Then the Graduate Studies Office decided how many reviews could be carried out in any given year. Some changes have been made to the original calendar and there are currently no plans to add another program on specific timeframe. The Graduate Studies Office is updating program and department definitions for the next review calendar.

Review Plan

The first step in the Program Review process is to prepare a Review Plan, which consists of "a statement of the program mission and objectives, a statement of any special issues that the

department/unit would like considered in this review, and a list of the data points that will be collected in order to evaluate the program's compliance with its mission and objectives, and to address the any specific issues" (School of Education, p. 1).

Self-Study

A Self-Study is then prepared by a program committee of full-time faculty that address the following components.

1. Overview of the Program

The overview of the program should address the reputation of the academic program at the international, national, and/or regional perspectives. Programs that are core-campus in their structure will need to address the structural relationship that exists between the campuses. The review should clearly state the academic program's mission and purpose, and highlight all campus and community partnerships.

2. Learning Outcomes

Departments/programs will need to outline the learning outcomes that are associated with the degree program. A description of how the learning outcomes are measured should also be included. Addressing the learning outcomes should include a description on the strategies that are used for students to attain the learning outcomes (curriculum and/or pedagogy tactics).

3. Enhancing Diversity

Departments/Programs should include efforts at increasing the diversity of faculty, staff and student populations. Support structures for underrepresented groups should be established and accessible to the student populations. Indiana University School of Education shared goals include Diversity as a school-wide priority and can be found on the SOE web site under the "Community" link.

4. Recruitment/Yield

In order to gauge how your graduate program can attract the brightest and most qualified students, it is crucial to review recruiting practices, admissions procedures, and criteria for admission. Furthermore, each program needs to collect data on number, scores and demographics of student applicants, of students admitted and declined, and of final matriculation.

5. Curriculum

Departments/Programs will need to outline recent and planned curricular and programmatic changes for their respective degree offerings.

6. Advising and Mentoring

Once students are admitted to the program, they need to be advised, mentored and supported to guarantee adequate progress toward degree completion. Orientation, assigning and meeting regularly with an advisor, regular reviews of student progress, opportunities for professional development, and assistance with career placement are essential steps. Emphasis on good mentoring, both formally and informally, is an essential component of a high quality program.

7. Professional Development/Al Training

Documentation of how students are trained, advised and mentored for teaching and other academic and research positions or how they are given guided professional development opportunities is to be shared in the report. Definition of positions and the specific resources provided to students, as well as description of faculty guidance should be documented.

8. Resources

UGS requires this question to be answered: Please identify the resources you have available for supporting students from institutional, governmental, and private sources. What steps have been taken to generate support (both fiscal and human resources)?

9. Quality Assessment

In this section the program should reference the program's assessment plan, which will document the programs learning goals, procedures for evaluating the extent to which students develop competency related to those goals, and changes either implemented or planned as a consequence of the accumulated evidence. Quality assessments for faculty are also to be included in this section, as are assessments of graduate students. A summary of the annual activities should be provided.

10. Strategic Planning

UGS requires that a long-range planning document be included in the program review. Strategic planning should also outline goals for the program and how those milestones will be evaluated. The program should also highlight the current challenges that are facing the growth of the program.

11. Retention/Placement

Programs should provide a description of advising and mentoring efforts related to future employment and placement data for graduates for the past 3-5 years.

External Review

The completed Self-Study sets the stage for the next step, which is an External Review conducted by two external reviewers and one reviewer that is from the university, but outside the school. The guidelines suggest that a report should be prepared that provides advice or recommendations for improvement and addresses any features of the program that the review committee identifies as needing comment. Typically a report provides a summary of program strengths, challenges, advice, and recommendations for improvement or focused attention.

Program Response

The final phase of the review process is for the program to prepare a Response to the address the recommendations and other issues. Reports should be reviewed by program area in conjunction with department chairs and the Associate Dean of Graduate Studies on the appropriate campus to

identify program strengths that are to be maintained and summarize the recommendations for improvement. Requirements for follow up reports or actions will also be identified with a timeline for action. This response is to include how and when each recommendation will be addressed and is presented to the Associate Dean and to the Graduate Studies committee.

Appendix B

Program Review Summary

Program	A	B	C	D	E
Program level	Masters	Doctoral	Doctoral	Masters	Doctoral
Time frame	2008-2013	2008-2013	2000-2014	2010-2014	2009-2013
Interviews conducted	<ul style="list-style-type: none"> • Department chair 	<ul style="list-style-type: none"> • Program coordinator • Administrative staff 	<ul style="list-style-type: none"> • Program coordinator 	<ul style="list-style-type: none"> • Department chair • Program coordinator • Faculty member • Administrative staff 	<ul style="list-style-type: none"> • Department chair & program coordinator • Faculty member • Administrative staff
Documents provided	<ul style="list-style-type: none"> • Self-Study • External Review 	<ul style="list-style-type: none"> • Review Plan • Self-Study • External Review 	<ul style="list-style-type: none"> • Review Plan • Self-Study • External Review 	<ul style="list-style-type: none"> • Review Plan • Self-Study • External Review • Response 	<ul style="list-style-type: none"> • Review Plan • Self-Study • Response

Appendix C

Request for access to Program Review documents

Dr. Someone

As part of my dissertation, *Data Usage within Higher Education Departments: An In-depth Case Study with Analysis*, I would like to review the documents related to the recent Program Reviews of the **Program Name**.

The purpose of my study is not to evaluate the quality of the program or the Program Review process, but to understand how data are used in higher education departments, specifically in the context of academic program reviews. The research question that will guide the study is: What do mandated program reviews reveal about the types, sources, and uses of data in academic departments? A document analysis of the Program Review documents (Review Plan, Self-Study, Final Report) is an initial step in conducting my research. In a separate, but parallel process, I hope to conduct individual interviews with Department Chairs and others that participated in the process.

Of course, all of these documents will be kept confidential and will only be used for my research purposes. Please let me know if you have questions or need additional information. If you approve of my request, I will forward your approval to the Graduate Studies Office for access to the documents.

Thank you.

Sally Jamerson

Appendix D

Interview Protocol

Thank you for agreeing to this interview. Do you mind if I record this?

Review the Study Information Sheet and the purpose for the interview

Administrator questions

- What are the goals of the Program Review process?
- How was the process developed?
- What do you see as the strengths and limitations of the process?
- What do you see as the strengths and limitations of the results?
- What are the similarities or differences in the five completed reviews?

Participant questions

- What was your role in the program review process? Who else participated?
- Would you describe the process? Who did what?
- What was the most enjoyable or easiest part of the process?
- What was the most difficult or time-consuming part of the process?
- Specific clarifying questions from the document analysis, such as sources of data
- What did you think of the overall process?

- How could the process be improved?

Verify emerging themes from the document analysis

For those who were in charge of the process:

- Who else should be interviewed and why?

Thank you again.

Appendix E

Participant email Solicitation

Dear Some Person,

I would like to invite you to participate in an interview for my research project concerning the use of data within higher education departments. The purpose of this study is to increase the understanding of the use of data at the department level by examining five completed program reviews and interviewing faculty, administrators, and staff that participated in the review process. You have been selected to participate because you were identified as someone who participated in the recent Program Review process for your department.

The interviews will be conducted in August, 2016. The interviews will last approximately one hour and may be conducted either in-person or on the phone. There are no foreseeable risks associated with participating in this project and you will receive no compensation for your participation. Please understand that your participation is voluntary. You have the right to refuse to answer any question(s) for any reason without penalty. You also have the right to discontinue the interview without penalty. If you discontinue the interview, your results will not be used.

Your participation in the interview indicates that you understand the above information, and voluntarily consent to participate in the project. The data collected from this interview will only be accessible to the researchers of this study.

Please let me know by mm/dd/yy, if you would are interested in participating in this study. If you have questions or need additional information, please do not hesitate to contact me at (812) 375-7530 or sjamerso@iupuc.edu.

I look forward to hearing from you.

Thanks.

Sally Jamerson

Appendix F

Study Information Sheet

You are invited to participate in a research study to analyze how higher education departments use data. You were selected as a possible subject because you were identified as someone who participated in the recent Program Review process for your department.

If you agree to participate in this study, you will be asked to participate in a semi-structured interview and possible follow-up conversations. The interview will be a private, one-on-one interview conducted in August 2016. The data collected from this interview will only be accessible to the researchers of this study. Every effort will be made to keep your personal information confidential. Your identity will be held in confidence in any reports in which the study may be published. The researchers will keep the interview transcripts secure and only accessible to them.

There are no foreseeable risks associated with participating in this project and you will receive no compensation for your participation. Please understand that your participation is voluntary. You have the right to refuse to answer any question(s) for any reason without penalty. You also have the right to discontinue the interview without penalty. If you discontinue the interview, your results will not be used.

For questions about the study, contact Sally Jamerson at 812 375 7530 or sjamerso@iupuc.edu. For questions about your rights as a research participant or to discuss problems, complaints or concerns

about a research study, or to obtain information, or offer input, contact the IU Human Subjects Office at (812) 856-4242 or (800) 696-2949 or by email at irb@iu.edu.

Appendix G

Self-Study Analysis Matrix

Item of analysis	Program A
Overall	
<ul style="list-style-type: none"> • Completeness 	All questions answered; 36 pages
<ul style="list-style-type: none"> • Tone and style document 	1 st person, plural
<ul style="list-style-type: none"> • Quality of the document 	Typos and formatting errors
Enhancing Diversity	
<ul style="list-style-type: none"> • Data provided 	Yes
<ul style="list-style-type: none"> • Source of data 	Institutional data
<ul style="list-style-type: none"> • Type of data 	Tables of matriculates and graduates by gender and ethnicity
<ul style="list-style-type: none"> • Summary of data 	None
Recruitment / Yield	
<ul style="list-style-type: none"> • Data provided 	Yes
<ul style="list-style-type: none"> • Source of data 	Department and school records
<ul style="list-style-type: none"> • Type of data 	
<ul style="list-style-type: none"> • Summary of data 	Discussed overall 5 year trends

Curriculum	
• Data provided	No
• Source of data	
• Type of data	
• Summary of data	
Advising and Mentoring	
• Data provided	Yes
• Source of data	Student survey
• Type of data	Student satisfaction
• Summary of data	Future plans
Professional Development	
• Data provided	Yes
• Source of data	Departmental records
• Type of data	Counts of workshops attended
• Summary of data	None
Clarifying questions	Item A says XX, but Item B says YYY

RESUME
SALLY JAMERSON

EDUCATION

Indiana University, School of Education - Ed.D. in Instructional Systems Technology with a minor in Higher Education / Institutional Research.

Indiana University, School of Business - M.B.A., major in Management and Administration, with an emphasis in Organizational Development.

Purdue University, School of Science - B.S., major in Mathematics, minor in Computer Science.

EXPERIENCE

Senior User Education Specialist, Center for Teaching and Learning, IUPUC – February 2011 to present
Current responsibilities include providing instructional technology support to students and faculty by providing workshops and individual consulting. Activities include identifying instructional needs, developing appropriate resources and materials, and assessing the effectiveness of the instruction. Additional responsibilities include participation in appropriate campus committees and ongoing professional development.

Administrative Officer, Executive Education, IUPUC – August 2010 to February 2011.
Responsible for startup activities to develop professional development programs for managerial level employees. Additional activities included teaching BUS K201 – *The Computer in Business*.

Vice President, United Way of Bartholomew County – January 2000 to August 2010.
Responsible for all administrative, human resource and technical support activities. Major activities, in addition to daily operations, included design, development and implementation of new on-line fundraising system to support campaign development and funds distribution. Administrative services included planning, financial and technical support for a nonprofit organization with an annual budget of more than \$5 million and a Board of Directors consisting of 25 community business leaders. Responsible for direct supervision of 4 staff.

Adjunct Faculty, IUPUC - January 2000 to May 2005.
Responsible for teaching multiple classes per semester in Computer Technology and Business, including personal computer applications, database development, Internet foundations, web page development and business communications. Received *Teaching Excellence Award* from Purdue University, School of Technology.

Project Director, Information and Communications Technologies Task Force- May 1995 to January 2000.
Responsible for planning a technical infrastructure for Columbus and Bartholomew County. Major activities included the development of a community web site and planning a community WAN.

Assistant Professor, Computer Technology, Purdue University - August 1991 to May 1995.

Responsible for a full-time teaching load and individual student instruction. Classes taught included Microsoft Word, Excel, Access, WordPerfect, Lotus 1-2-3, dBase, DOS and Windows, Systems Analysis and Design and COBOL programming.

Part-time Instructor, Indiana University, School of Business, August 1990 to May 1991.

Responsible for teaching one section and coordinating three sections of *The Computer in Business*. The course was revised from a FORTRAN-based class to microcomputer-based, including DOS, LOTUS 1-2-3 and dBase III+.

Director, Data Services Department, Ivy Tech, August 1985 to December 1989.

Developed and implemented a 5-year plan to upgrade administrative computing on a statewide basis, including a \$3.9 million capital plan for new equipment and software systems. Developed and implemented short and long range planning and budgeting procedures. Responsible for management of 25 employees and approximately \$4 million operating budget.

Systems Analyst Supervisor - Senior Systems Analyst, Central Data Processing, State of Indiana, July 1982 to August 1985.

Designed and implemented statewide programs for the effective deployment of office automation and microcomputers throughout state government offices. Provided training to over 70 people in 20 different agencies. Responsible for management of 5 employees.

Information Services Manager - Programmer/Analyst, Administrative Computing, Indiana University, December 1980 to July 1982.

Responsible for all programming projects estimated at less than 50 hours, approximately 200-250 per year. Responsible for management and development of 2 to 5 part-time student programmers.

Programmer/Analyst, School of Medicine, Indiana University, July 1978 to December 1980.

Responsible for design, programming, implementation and maintenance of 8 on-line and batch computer systems.