

**Enhancing and inhibiting interactions between
business processing and knowledge production:
A macro study of leadership and knowledge processing in higher education.**

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**This document is a revised version of Dr. Martin's dissertation. The
dissertation was completed as a requirement for a terminal degree in
Educational Leadership at Clemson University, SC.**

May, 2004

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Abstract

In this study the critical role of emergent, complex leadership in higher education was examined to define how such leadership enabled an environment that embraced the demands of a knowledge-based organization. Through interviews with executive leadership in several higher education institutions, the ontology of knowledge management was evaluated and the methods by which epistemic gaps are resolved were explored. The question of how leadership behaviors, policies, and programs enable or inhibit knowledge-processing activities was analyzed. Theorist Mark McElroy and the Knowledge Management Consortium International framework, "The Knowledge Life Cycle," served as the theoretic framework for this discussion. The following four propositions were tested: 1) Effective interaction between business processing and knowledge production is constant, seamless, and barrier free; 2) knowledge processing is a bottom-up social process that is enabled by complex network dynamics; 3) in knowledge processing, control is embedded in network dynamics rather than leaders; 4) organizational vision is a knowledge claim that must be collectively produced, tested and validated.

The results of this study found that the KLC is an effective framework in outlining organizational learning. We identified leader roles in knowledge processing and suggested the existence of a new skill, knowledge gap identifier, as important to knowledge processing. The leader has tremendous control over the knowledge-processing environment. Enabling behaviors and inhibiting behaviors that impact this environment were identified. Enabling behaviors include open and transparent management, removal of barriers to allow for self-organizing networks, and selection and placement of key team members that support the knowledge-processing environment. Inhibitors include staff resistance, fear from loss of organizational control, lack of clear policy, and the comfort of success.

Several areas to expand this research were identified. The role of leadership in the business-processing environment has broader impact than the resolution of knowledge gaps. The leader must continue to challenge the business-processing environment, a process that creates knowledge gaps and leads to a fine tuning of the organization. Also, common threads of the knowledge-processing environment were recognized. Methods can be developed to quantify the perception of the knowledge-processing environment that can lead to a deeper understanding of knowledge production and would lead to training programs for leaders to enhance this environment.

Introduction

The key to future competitive advantage will be the organization's capacity to create the social architecture capable of generating intellectual capital. And leadership is the key to realizing the full potential of intellectual capital. (Bennis, 1999, p. 19)

For organizations to succeed, they must adapt to and manage epistemic gaps. Epistemic gaps (i.e., knowledge gaps) exist when the daily processes of an organization are impacted by internal and/or external influences that potentially compromise success. It is essential that the organization enable an environment that welcomes a continuous process of evaluating, analyzing and responding to such gaps. The organization must have an invitation to learn. In this study, the researcher argues that how an organization resolves knowledge gaps is a process that is essential to its immediate and future success. Also, the leadership role is critical in maintaining an environment that enhances this process.

There are challenging realities in the leadership of today's organizations. Advances in information technology have allowed organizations to increase productivity and enhance operations, and this technology has contributed to a proliferation of information. Leadership must create an environment to enhance the growth and application of organizational knowledge. Knowledge gaps are best resolved in an environment that enables the search for solutions and allows for testing and validation. Once validated, leadership must allow for the integration of solutions so the organization can adapt to the new environment.

According to Drucker (1998), since modern business enterprise first arose, there have been two evolutions in the concept and structure of organizations. The first occurred between 1895 and 1905. It distinguished management from ownership and defined management tasks. The second evolution occurred 20 years later. This evolution introduced the command and control organization of today, with its emphasis on decentralization, central service staffs, personnel management, the whole apparatus of budgets and controls, and the important separation of policy and planning from operations. Drucker (1998) states that organizations are entering a third period of change: the shift from the command and control organization to information-based organizations, the organization of knowledge management.

Marion and Uhl-Bien (2002) and Bryman (1996) report that the role of leadership has transitioned as organizational paradigms have changed. They cite three specific transitions: management of influence, management of meaning, and management of emergence. Management of influence is leadership that seeks to influence workers to achieve management-endorsed goals. Leadership control was evident in many early manufacturing organizations that emphasized internal structure and process (i.e., scientific management). Management of meaning refers to leadership in terms of one who helps workers define symbolic importance. This perspective was popularized in the 1980's and is evident in the transformational theories of Bass and Avolio (1993); TQM, popularized by Edward Deming; and Culture Theory, which is most often associated with Edgar Schein (1992). Finally, management of emergence shifts the leadership

perspective from management of people to management of conditions that enhance the emergence of innovation and knowledge (Marion & Uhl-Bien, 2002).

Organizations have evolved to become information based (as Drucker states) and that leadership must focus on emergence conditions in order to successfully manage knowledge processing (as Marion and Uhl-Bien state). In this study, the critical role of emergence leadership in higher education and environmental conditions that embrace the demands of knowledge-based organizations are examined.

The science of knowledge management is concerned with how knowledge is created, what motivates its production, and how it is integrated into the life of the organization after it is produced. Barquin (2001) defines knowledge management as “the process through which an enterprise uses its collective intelligence to accomplish its strategic objectives” (p. 128). Through the Knowledge Management International Consortium, Inc., a framework outlining how knowledge is produced and integrated into organizational systems is suggested. This is the Knowledge Life Cycle (KLC).

In the context of this study, the following definitions apply. Organizational learning is defined as the emergence and integration of solutions to epistemic gaps that enable the organization to achieve objectives. Knowledge management (KM) is the science that outlines the rules for organizational learning (McElroy, 2003b). KM is a management discipline that seeks to enhance knowledge processing. Knowledge processing is composed of social processes that account for the production and integration of knowledge in organizations (Firestone & McElroy, 2003). Knowledge production is the creation of new knowledge. Knowledge integration reflects upon the application of newly produced knowledge to the business-processing environment. Business processing is defined as the daily operations and routines that sustain the day-to-day activities of the organization. A knowledge claim represents potential knowledge which may be held as validated knowledge at an individual and/or group level but which has not yet been subjected to a validation process at an organizational level.

Study Proposal

For the past 75 years organizational science has focused on controlling uncertainty. For the past ten years, complexity science has focused on how to understand organizational uncertainty so as to better go with the flow and perhaps channel energy to enhance the success of the organization (Lissack, 1999). The complex leadership style does not seek to control uncertainty as much as it calls for the establishment of an environment that encourages bottom-up emergence of organizational knowledge. The primary leadership role is to foster an environment in which healthy networks can be established, the organization develops a capacity to learn (Senge, 1990), and tacit knowledge can be transformed into explicit knowledge (Nonaka & Takeuchi, 1995). Proper use of power in complex organizations is not a weapon to dominate employees; it is rather a tool to open new and creative opportunities. It is used to remove obstacles to emerging networks.

This new knowledge era defines organizations as Complex Adaptive Systems (Marion, 1999) in which fitness (i.e., the resolution of epistemic gaps) emerges from cooperative support networks. Complex systems are learning organizations. Complexity theory, therefore, is essentially a theoretical framework for knowledge management. It

proposes that systems are not structured to get people to innovate; rather, innovation is a natural product of appropriately interacting and interdependent social networks. Leaders can, however, enhance the environment for innovation through policies and programs that support, strengthen, and reinforce the natural tendency for emergent behavior to occur.

The higher education setting offers a complex environment comprised of networks of independent agents that are tied together by common traditions and bonds. It is a setting that is ideal for a macro analysis of leadership and the production of new knowledge. This will be done by drawing upon the knowledge of senior leaders in a variety of higher educational settings. Gaining a grasp of macro issues in higher education will form a foundation for future studies at the micro level and, ultimately, can lead to an instrument to analyze the health of the “emergence environment.” Knowledge-processing dynamics exist at multiple levels in higher education (as well as in other organizations), and the leadership function in maintaining a healthy knowledge-processing environment is critical in organizational learning and the development of new knowledge.

A review of current literature suggests there is a critical interplay between the process of managing the organization – “business processing” - and the process of resolving knowledge gaps that develop within the organization – “knowledge processing” (McElroy, 2003b). This cycle of organizational learning is represented as the Knowledge Life Cycle (KLC) that will serve as the framework for the study. As McElroy (2003b) and others state, knowledge processing speaks of new ideas, new insights, and outright innovation as a function of interaction between people and/or the acquisition of knowledge. Under complexity theory, knowledge processing is a social process involving a variety of self-organizing agents interacting on a variety of network levels. As new knowledge claims are produced, tested, validated and accepted, claims become solutions and are integrated into the management of the organization. This return to business processing mode indicates that the organization has resolved the knowledge conflict and, in essence, has learned.

Effective knowledge processing is constant, seamless, and barrier free. In a dysfunctional setting, barriers exist that inhibit and obstruct organizational learning. These barriers can be modified and removed by effective leadership or, conversely, they may be created as controlling mechanisms. Successful patterns of leadership are sought that deal with such barriers in ways that enhance the learning capacity of the organization. These barriers will be most evident in the nexus between business processing and knowledge processing and once new knowledge is identified, validated and confirmed the transition of new knowledge into the business-processing system. The learning environment and the barriers that are managed by leadership in higher education will be examined to identify examples of successful strategies that enhance organizational learning.

Knowledge processing is a social process and interacting networks are essential to that process. Effective leadership identifies and breaks down obstacles to maintaining healthy network interactions that enable the organization to enhance the KLC of the organization. Leaders can open up the organizational learning process by making it more transparent and inclusive. Bennis and O’Toole (2000) state that business managers must know how to build social architectures for openness.

The success of knowledge processing is contingent upon leadership establishing an organizational climate that enables the resolution of knowledge gaps. How new knowledge, once identified and validated in the knowledge-processing environment, is integrated into the business-processing capacity of the organization is of interest in this study. Leadership roles need to be redefined as they pertain to the knowledge-processing environment.

Two critical transitions occur in the KLC. Following the realization that a knowledge gap exists, the environment must allow for a transition from business processing into a knowledge-processing mode. A leadership role is to identify, resolve, and remove barriers that inhibit the transition from business processing into knowledge processing. Once this is accomplished, the organizational knowledge-processing capacity improves greatly. Having a knowledge-processing awareness, the leader's ability to remove barriers is a tremendous asset in resolving knowledge gaps.

Following testing and validation, a second transition occurs as new knowledge transitions into business processing and completes the KLC. Leadership must enable the organization to allow for an environment in which the KLC occurs continuously and seamlessly. The cycle suggests the antithesis to traditional direct leadership strategies in which the leader takes control in creating solutions to knowledge gaps. In the knowledge-processing environment, the leader does not mandate solutions. The leader's role is to ensure barriers are removed so that these transitions can occur and the organization, as a result, is allowed to learn.

Knowledge outcomes and processes are not managed by the leader. Human knowledge is fallible, and an autocratic approach to knowledge processing creates barriers for effective resolution of knowledge gaps. Simply, management does not have all the answers (Popper, 1961, 1972). McElroy (2003b) states that organizational leadership that enables high-performance knowledge processing has less to do with imposing patterns of behavior on workers than it does with establishing an environment where judgment or criticism of policies is welcome. Leaders stimulate individuals at all levels to question to resolve gaps. This open interaction creates knowledge that enhances the success of the organization. McElroy (2003b) suggests that leaders must seek an "Open Enterprise" environment in which an ethic of open knowledge sharing prevails. Members of the open enterprise have a duty to hold ideas accountable to the tests and evaluations of others.

The purpose of this study is to analyze and contrast how knowledge processing in higher education is engendered or inhibited by leadership policies and programs. Patterns and philosophies of leadership are examined that create an environment that releases traditional control schemes and welcomes emergent, horizontal debate on solutions to knowledge gaps. The Knowledge Life Cycle framework is applied against the higher education setting. Following a qualitative model, new study questions will emerge. In discussions with higher education executives, patterns emerge which clarify these questions and allow the researcher to establish recommendations for further research of these critical organizational and leadership issues.

The literature suggests that leadership patterns in the higher education setting are comparable to those in many organizations. While knowledge management is a growing field that has received ample scholarly attention, there has been limited study on leadership issues in the higher education setting. This study contributes to this body of

knowledge and identifies patterns of effective leadership behavior that enhances the knowledge-processing capacity of higher education.

Review of Literature

As a leader in the concepts of organizational learning, McElroy (2003a) challenges leaders to imagine an organization in which innovation is the top priority, a company in which the culture supports creativity and problem solving. Barnevik states, "Organizations ensure that (people) use only 5 to 10 percent of their abilities at work. The challenges for leaders, he added, are to learn how to recognize and employ that untapped ability" (Bennis, 1999, p. 19). The reality is that today's organizations exist in a new "knowledge era." To insure success, leadership must respond to new rules and conditions. The essential ingredient is the development and integration of organizational knowledge (i.e., tapping into and utilizing the 90% of worker ability that has been neglected) by all agents of the organization. Maintaining an inviting environment for organizational learning to occur is a leadership priority, and this environment must become integrated into the very fabric of the organizational being.

According to Bettis and Hitt (1995), the competitive landscape of the new knowledge era is characterized by increased pressure to reduce costs, a knowledge revolution, greater uncertainty resulting from an accelerated rate of change, and a focus on speed, flexibility and adaptability. Organizations have moved from a division of walls to an ongoing process of integration and interconnectivity among markets, technologies and firms (Barkema, Baum, & Mannix, 2002).

Burns (2002) states that over 80% of the world's technological advances have occurred since 1900 and technology is increasing at rates that defy calculation. The amount of information is doubling every five years, and it is available more broadly than ever before (Prichett & Pound, 2001). Leaders must invite creative responses to the demands of the environment by developing an organizational environment that welcomes experimentation and open discussion. All organizational levels and respective agents within the environment must understand that emergent thinking has become the new leadership pattern. Leadership in maintaining a knowledge-processing environment and the codification of new knowledge are foundational to the competitive edge in this economy.

Knowledge management, in the context of this study, outlines the conditions for the creation and integration of new knowledge into the business-processing function of the organization. It does not reflect the identification and placement of information. There is a difference between information and knowledge. "Information is the flow of messages, while knowledge is created by that very flow of information and is anchored in the beliefs and commitments of its holder" (Nonaka et al., 2001, p.13). Information is the end product of newly created knowledge that may or may not be distributed throughout the organization. Unused, or improperly applied, information has little value. Knowledge is the product of innovation, and through the KLC, it offers solutions to specific gaps within the organization.

Sveiby (1997) contends that the confusion between knowledge and information has caused managers to sink billions of dollars in information technology ventures that have yielded marginal results. Also, Sveiby (1997) asserts that business managers need to realize that unlike information, knowledge is embedded in people, and knowledge creation occurs through a process of social interaction. Nonaka (1995) has emphasized that only human beings can take the central role in knowledge creation (Nonaka &

Takeuchi, 1995). Nonaka argues that computers are merely information gathering tools, however great their processing capabilities may be (Nonaka & Takeuchi, 1995).

The current conception of IT-enabled knowledge, or “first generation” knowledge management (McElroy, 2003b), does not address the processing of tacit knowledge. Tacit knowledge is deeply rooted in an individual's action and experience, ideals, values, or emotions (Nonaka & Takeuchi, 1995). Although tacit knowledge lies at the very basis of organizational knowledge creation, it is personal and hard to integrate fully into the organization.

Brown and Duguid (2001) underscore that new knowledge frequently emerges from small communities within the organization. Great new ideas help those organizations with the discipline and infrastructure to implement them. The leader must recognize and enhance the social interactions that are necessary for knowledge to develop.

The Knowledge Life Cycle

A critical interplay exists between the process of managing the organization, “business processing,” and the process of identifying and validating solutions to resolving epistemic issues within the organization, “knowledge processing.”

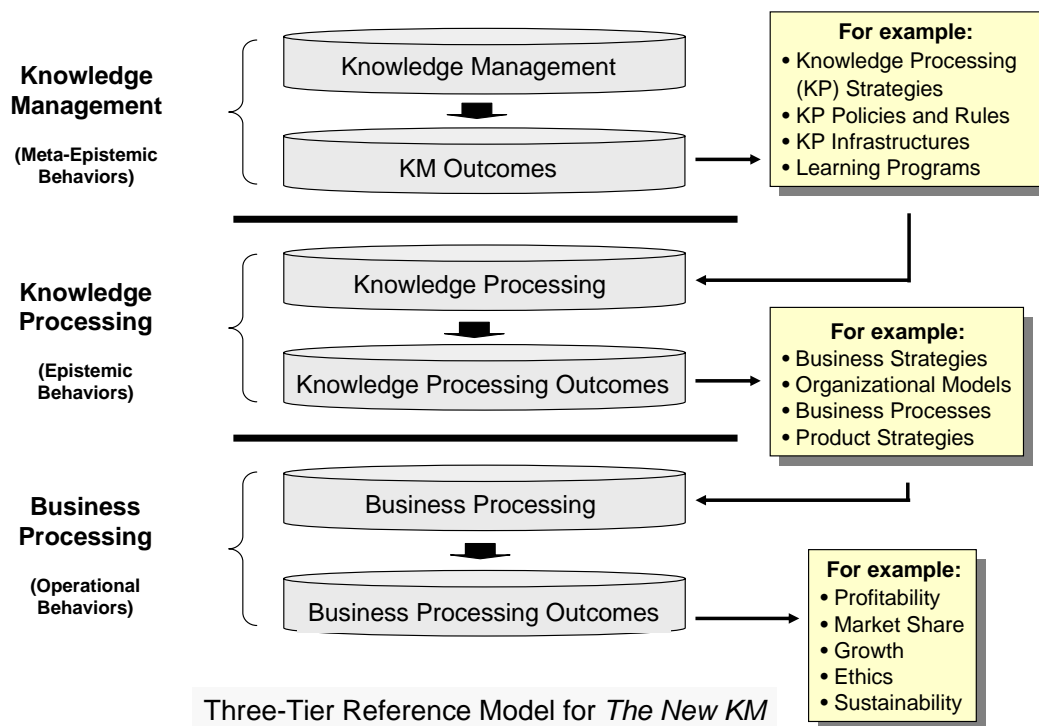
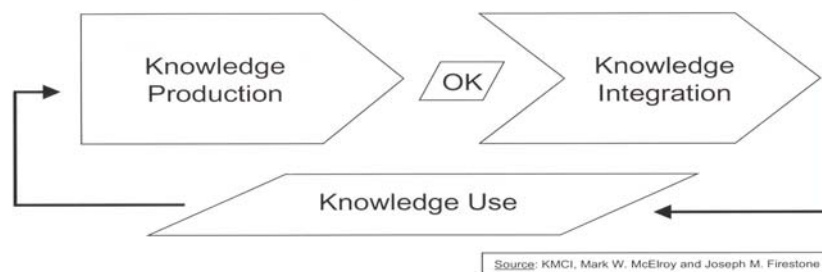


Figure 2.1. – Knowledge processing and business processing. Used by permission. Mark W. McElroy, 2003.

Figure 2.1 examines the relationship between the business-processing and knowledge-processing environment. Business processing functions include discussions and decisions in strategy sessions in dealing with existing and clearly understood challenges. For example, as problems arise in business processing, predetermined solutions exist that may be applied. A problem or gap is recognized and a solution is identified and applied. On occasion, there are no solutions available. This void may be the result of a new environment, change in technology, or change in organizational culture. Thus, there is a knowledge gap, and the need for knowledge processing emerges.

Knowledge Processing



A (Social) Life Cycle View of Knowledge Processing

Figure 2.2 – Social Life Cycle View of Knowledge Processing.
Used by permission. Mark W. McElroy, 2003.

There are several leader controlled transitions in the relationship between business processing and knowledge production. This is the relationship between business processing (demonstrated in Figure 2.2 as knowledge use) and the creation and integration of new knowledge. The ideal interaction between business processing and knowledge production is constant, seamless, and barrier free. The nexus between these functions is defined as “knowledge-processing” activities, or the policy, programmatic, and regulatory context within which they occur. In a dysfunctional setting, barriers exist within the knowledge-processing environment that inhibit the relationship between these functions and obstruct organizational learning. Leadership has tremendous influence over this environment. The environment must be favorable for new knowledge to be generated, validated, and integrated into the business-processing environment. Leadership serves as a gatekeeper over these transitions in the Knowledge Life Cycle.

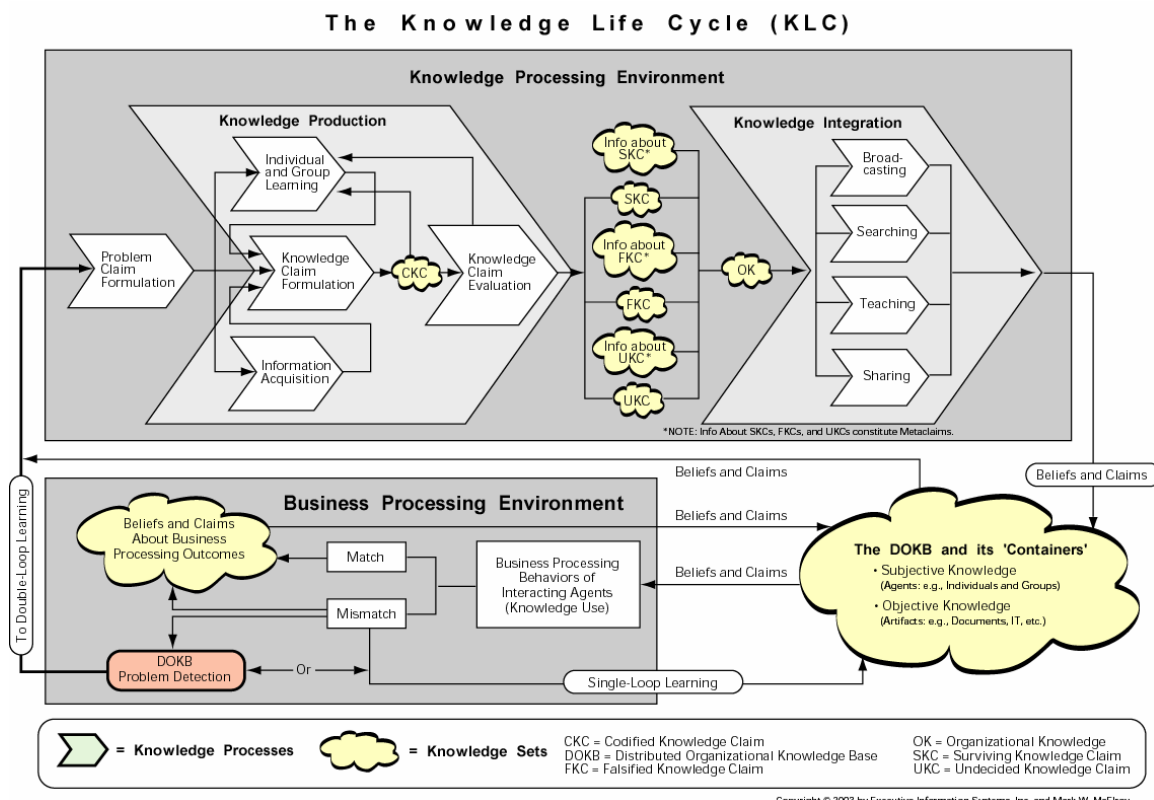


Figure 2.3. – The Knowledge Life Cycle
Used by permission. Mark W. McElroy, 2004.

Figure 2.3 expands Figure 2.1 and Figure 2.2 and introduces the framework for this study: The Knowledge Life Cycle (KLC). The “cycle” application of the KLC is clearly evident. The business processing environment represents the daily operation of the organization. As knowledge gaps are identified, and the climate is favorable, the organization enters into knowledge processing. Knowledge claims are formulated, tested and, once validated, are recognized as solutions (new knowledge). Next, these solutions return to business processing as organizational knowledge (i.e., a solution to the original gap in the process - resulting in organizational learning.)

As demonstrated in the KLC framework, there is a need for individual and group learning accompanied by information acquisition. This function is clearly important to the argument that effective networks are essential in knowledge processing. Individuals, participating in self-organizing networks offer different perspectives and ideas on how to resolve the gap, strengthening solutions. As the KLC occurs, new problems often arise, requiring the cycle to repeat itself. The constant, cyclical pattern of behavior emerges as organizations self-organize around the production, diffusion, and use of new knowledge (McElroy, 2003a). As people engage in learning and innovation, they attract others with whom they share similar needs or interests and networks form (Marion, 1999).

How do leaders know that the organization is seeking new knowledge? Indicators exist within business processing that reveal the existence of a knowledge gap. An important leadership skill is to know when the organization encounters a knowledge gap and allow for the proper transition into the knowledge-processing environment.

McElroy (2003a) discuss concepts that reflect the Knowledge Life Cycle as he introduces the “Macroinnovation Method” (sometimes referred to as the Policy Synchronization Method, developed by McElroy, Cavaleri, and Firestone, 2002) to establish the knowledge processing environment.

“To some, the growth of networks or allowing external agents to participate in establishment and validation of knowledge claims is threatening. However, effective networks are essential in formulating potential solutions to problems, which are then subject to evaluations. Solutions or “claims” that survive the evaluation process are open to adoption at different levels of scale by individuals, by groups, and/or by the organization as a whole. Once adopted, this knowledge becomes available to business process.

Leaders are not managing knowledge outcomes or processes. Leaders do manage the policies and programs that either enable or inhibit the knowledge-processing cycle. Policies and programs that support, strengthen, and reinforce the self-organizing pattern of interest combine to enhance learning and innovation. In a successful, “seamless” environment, policies are established to invite and encourage continuous application of the KLC cycle. The organization is so in-tune to the need for responsiveness that agents may not even realize they participate in this cycle.”
McElroy (2003a)

The knowledge-processing environment can be managed, and this concept is the key to this study. In an ideal environment, the nexus between business processing and knowledge production is seamless and barrier free. This seamless transition is critical to the learning capacity of the organization. A leadership role is to identify barriers to the “transition” from business processing into knowledge production. These barriers can be identified, resolved (perhaps in the KLC itself), and removed, greatly improving the organization’s knowledge-processing capability. In this study, higher education is used as a study setting to test the Knowledge Life Cycle.

Higher Education as a Study Setting

Higher education stakeholders are demonstrating a renewed interest in monitoring productivity and accountability, suggesting lost confidence in the academy (Carlin, 1999). Boards of Trustees and senior leaders across the country are being pressured to run higher education “like a business” with profit/loss statements and improved returns on investments. Tenure is being challenged, with nonacademic leaders referring to tenure as “an immoral business practice with a mandate for faculty to be unaccountable to the customers they serve” (Carlin, 1999).

Problems identified in higher education include “exorbitant tuition, tenure, unnecessary research, bloated bureaucracies, low admission and graduation standards,

remediation, numerous existing programs, light teaching loads, lack of accountability, narrow-minded faculty unions, and shared governance that leaves nobody in charge” (Carlin, 1999). To meet the needs of a changing economy and changing society, higher education must adapt and leadership must provide the environment for this “learning” process to occur. Higher education espouses many of the concepts of knowledge management discussed in this study.

Higher education has many of the attributes of a professional bureaucracy (Mintzberg, 1979). It has highly trained personnel; standard, yet complex procedures; authority of expertise; commitment to profession; and high levels of professional autonomy. Also, there are extensive patterns of networks in higher education. Faculty members interact across disciplines to enhance teaching and research, administrative departments collaborate to reach complex goals, and students are challenged to seek new paradigms in cognitive development. Healthy networks allow for interaction and conflict that lead to higher levels of production. These challenges and this environment provide an ideal setting for studying the Knowledge Life Cycle.

The KLC Environment – Proposition 1

Of interest is how new knowledge, once identified and validated in the knowledge-processing environment, is integrated into the business-processing capacity of the organization. Once knowledge has been produced and integrated, it becomes available for use in business processing, thereby allowing workers to return to business-processing mode (McElroy, 2000, 2003b).

Thus, knowledge processing speaks to the creation of new ideas, new insights, and outright innovation as a function of interaction between people internal and external to the organization. The integration and application of new knowledge in business processing (ostensibly resolving the original knowledge gap) completes the organizational learning framework. New procedural knowledge, for example, might lead to the discontinuation of how work is being done today in favor of a new set of business processes. Business processes are, according to McElroy (2003b), nothing more than codified procedural knowledge.

This study is dedicated to the transition between business processing and knowledge production and knowledge integration. This transition is enabled or inhibited through leadership influence. The following proposition outlines the focus of the study.

Proposition 1: Effective interaction between business processing and knowledge production is constant, seamless, and barrier free. The nexus between these functions is expressed as *knowledge-processing* activities, or the policy, programmatic, and regulatory context within which they occur. In a dysfunctional setting, barriers exist within knowledge-processing activities that inhibit the relationship between these functions and obstruct organizational learning.

Building and Nurturing Networks - Proposition 2

An important complexity leadership role is that of building and nurturing networks of interaction and interdependency. Complexity theory focuses on the

dynamics of such networks. As in chaos theory, complexity theory is a science of massive interacting networks and nonlinear cause and effect; however, unlike chaos theory, the dynamics of complex systems have stable characteristics (Marion, 1999). Learning is a social, self-organizing process in which networks emerge naturally when an environment welcomes the KLC.

The role in network building is to directly engage in network building activities and to legitimize network building. The leader can enhance network interaction through delegation by providing encouragement and resources to subordinates, or by removing institutional barriers which interfere in network construction. Leaders should initiate, encourage, catalyze, make connections, and learn when to leave matters alone (Marion, 2002). It is important to understand that complex leadership is not as much about maintaining or diminishing personal power as it is about creating networks that share power and seek solutions to knowledge gaps in the organization.

Complexity theory suggests that the imperfect nature of a leader's decisions contributes to the fitness of an organization. We agree that decision-makers cannot factor in all the contingencies that affect, or are affected by, a given decision (Stacey, 1996). If complexity theory is correct, imperfect decisions disrupt a fitness landscape and foster searches for improved fitness strategies.

Imperfections help networks do what they do best: search fitness landscapes for even better fitness strategies. Complexity studies indicate that the most creative phase of a system is the point at which emergent behaviors inexplicably arise, lying somewhere between order and chaos. Kauffman (1995) states that complex systems produce their most inventive displays in the region of behavior called "the edge of chaos." Systems operating in the vicinity of the edge exhibit wild bursts of creativity and produce new and novel behaviors at the level of the whole system. Marion (1999) states that chaos permits the better of two worlds: stability allows the organization to accumulate information while its chaotic side allows it to experiment with invention and change.

Another structural aspect of organizations and their learning environments is the extent to which learning-related groups (networks) actively exist. Leaders impact this by setting the conditions in which communities are more or less likely to emerge and the extent to which organizational resources (time, funding, infrastructure, facilities, and business processes) are made available to support them (Marion, 1999).

How and why such coherence emerges in complex systems is a mystery; however, understanding its influence on the performance of human organizations could lead to major gains in the conduct of human affairs (McElroy, 2003b). In a sense, complex systems innovate by producing spontaneous, systemic bouts of novelty out of which new patterns of behavior emerge. Patterns that enhance a system's ability to adapt successfully to its environment (or, in this study context, produce and integrate new knowledge) are stabilized and repeated; patterns that restrict adaptation are rejected in favor of radically new ones.

Proposition 2: Knowledge processing is a social process; thus, networks are essential. Effective leadership identifies and breaks down obstacles to maintain healthy network interaction that will enable the structural and operational environment to enhance the KLC of the organization. Leaders can open up the organizational learning process by making the organization more transparent and inclusive, and by relinquishing control

over what triggers business processing into knowledge production and also what concludes it and commits the firm to action (knowledge integrated into business processing).

Power and Control in Complex Organizations – Proposition 3

Control and power in complex organizations are not weapons to dominate employees, but they are tools to remove obstacles to emerging networks. The definition of strong leadership in the command and control era is quite different than in the emergent era. In the complex environment, leadership strength and resiliency is built upon a collaborative investment in all levels of the organization. Complex leadership strengthens the organization by releasing personal, “heroic” control and allowing for the creation and integration of knowledge in the KLC.

Organizational innovation almost invariably threatens the status quo. Pfeffer (1992) states that the inability to get things done and to have ideas and decisions implemented is widespread in organizations today. It is a problem that seems to be getting worse in both public and private sector organizations.

Power and control are often based on established rules and are difficult to maintain in a world where competitive survival depends upon questioning existing assumptions. Pfeffer (1992) states that the dynamics of the new business environment require a business framework that assumes existence of fewer rules, specific information and a lot of freedom. In this organization design, not only would individuals in the organization define problems and generate their own solutions, these individuals would also evaluate and revise the solution-generating processes. By explicitly encouraging experimentation and rethinking of premises, the KLC promotes reflection, creation of new knowledge, and innovation. McElroy (2003b) states that organizations will need to rethink and redefine their current models of success before they are marginalized by environmental change.

According to Pfeffer (1992), managing with power means recognizing that in almost every organization, there are varying interests. Bennis (1999) suggests that power in the knowledge era resides more with all employees than with owners or managers. Serving the needs of those workers is a new leadership imperative, and these individuals want a sense of significance. To achieve positive outcomes, the leader must provide a sense of purpose in the organization.

Complexity theory suggests a different leadership approach from traditional, control-oriented perspectives. It explores the emergence, growth, fitness, and demise of organizational forms and behaviors. For employees to have confidence, take risks and experiment, there must be some stability in the organization (Marion, 1999). Organizations learn when there is new information that is combined with knowledge and applied to new opportunities (Coleman, 1999).

McKelvey et al. (1999) states that when an individual controls group behavior, the group behavior can be no more complex than that individual. They argue that leadership theorists are wrong in advocating heroic leadership or visionary leadership concepts such as the person who single handedly leads the organization. These leaders inhibit emergent behavior by controlling it. Leadership first functions to continuously inspire individuals to revisit the ultimate purpose and core values of the system. Secondly, leadership

requires continuous assessment of environmental demands as they relate to the primary mission and values of the organization.

Workers need to take roles of self-leadership and self-regulation, as they are best positioned to sense the dynamic changes in their immediate business environment. Managers lose effectiveness when removed from the frontlines. Leaders need to facilitate the confidence of knowledge workers in acting on incomplete information, trusting their own judgments, and taking decisive actions for capturing windows of opportunity. In the emergent era, employee control is ultimately self-imposed.

Proposition 3: In knowledge processing, power and control are embedded in network dynamics rather than leaders. Redefining traditional schemes of power is essential for success.

Vision as a Knowledge Claim – Proposition 4

The complex leadership style calls for a shared vision and the establishment of an environment that encourages bottom-up evolution of organizational knowledge. However, to achieve full consensus, this vision must be created through KLC participation. In essence, it is no different than another knowledge claim (McElroy, 2003c). A key challenge for leaders in the knowledge era is cultivating commitment of knowledge workers to the organizational vision.

A strongly shared vision or organizational culture remains critical to meeting organizational goals. If individuals share “a common vision, perspective on what to accomplish and a common vocabulary that allows them to coordinate their behavior, management authority is less important” (Pfeffer, 1992, p. 37). Individuals are able to work cooperatively without waiting for orders from the upper levels of the company. Pfeffer (1992) states that managing through “a shared vision has become a popular prescription for organizations” (p. 36). Creating such an environment allows individuals to “share a language, values, and premises about what needs to be done and how to do it” (Pfeffer, 1992, p. 37).

Proposition 4: Organizational vision is a knowledge claim. In knowledge processing, vision must be collectively produced, tested and validated. Vision must motivate the organization intrinsically.

Ontology and Epistemology

To study an organization, it is important to have a conceptual understanding of that organization. “Ontology is an explicit specification of a conceptualization that is an abstract, simplified view of the world that that represents some purpose. Every knowledge base, knowledge-based system, or knowledge-level agent is committed to some conceptualization, explicitly or implicitly. Ontology is a description (like a formal specification of a program) of the concepts and relationships that can exist for an agent or a community of agents” (Gruber, 1993).

Why is it important to understand the ontology of knowledge management in higher education? In understanding this body of formally represented knowledge, leaders

acknowledge a common set of specifications for making decisions that enhance the learning environment of the organization. If researchers can define and defend the understanding of a common conceptualization, they can then identify patterns of behaviors that enhance knowledge sharing. An individual commits to a specific ontology if observable actions are consistent with the definitions in the ontology. As leaders, they seek practical applications to an environment that enhances this knowledge-management process. Understanding this ontology provides a conceptual base for this to occur.

Epistemology is the branch of philosophy that studies knowledge and knowing. It attempts to answer the basic question: what distinguishes true (adequate) knowledge from false (inadequate) knowledge (Joslyn, 2000). Practically, this question translates into issues of scientific methodology: how can one develop theories or models that are better than competing theories? The first theories of knowledge stressed its absolute, permanent character, whereas later theories put the emphasis on its relativity or situation-dependence, its continuous development or evolution, and its active interference with the world and its subjects and objects. The whole trend moves from a static, passive view of knowledge towards one that is more adaptive and active (Joslyn, 2000).

The ontology of knowledge management in higher education paints the landscape for a common understanding of how epistemic (“knowledge”) gaps are resolved. While this ontology creates common understanding of the conceptual issues, the actual recognition of gaps and the emergence of solutions is an epistemic process. For the organization to succeed, this process must be understood and the environment maximized for effective knowledge processing. An understanding of the nature of organizations and organizational change is essential to a study in knowledge management.

The work of Karl Popper is fundamental to a study of knowledge management. Popper states that the growth of knowledge is basic to the human experience (Firestone & McElroy, 2003). Further, he suggests that knowledge in itself is impossible to prove, but through examination, errors could be discovered and eliminated (Popper, 1961; Firestone & McElroy, 2003). Thus, the quality of our knowledge steadily improves as we eliminate the errors within it. Popper (1972) states that scientific theories cannot be verified; rather, they can be tentatively refuted, referred to as fallibilism. Popper also held that we only differ in the little bits of knowledge that we do have, and that this strengthens the case for co-operation in the advancement of knowledge. We must work together in the process of creating ideas and criticizing without restraint (Percival, 1991). Popper’s contribution to knowledge management is in the recognition that individuals do not have the capacity to know all the answers. It offers a theoretic foundation that questions the command and control leadership approach and allows for many of the core principles of knowledge management to emerge.

Organizational Learning

The propositions of this study outline concepts in relation to the creation and integration of new knowledge in an organization. It is important to understand how organizational learning has been examined in the literature in order to investigate the Knowledge Life Cycle as a framework for this process. What is organizational learning and how is it understood in the research community?

Argyris (1977) defines organizational learning as the process of detection and correction of errors. The process of detecting error is enabled in an environment that is open and transparent. According to Argyris (1977), "Individual learning activities are facilitated or inhibited by an ecological system of factors that may be called an organizational learning system" (p. 117). With respect to the present study, this ecological system of factors is the knowledge-processing environment that is enabled by leadership.

Senge (1990) defines the learning organization as "a group of people continually enhancing their capacity to create what they want to create" (p. 3). The concept of the learning organization is relevant given the increasing complexity and uncertainty of the organizational environment. Senge (1990) states that the rate at which organizations learn may be the only sustainable source of competitive advantage. McGill et al. (1992) suggests that the learning organization is a company that can respond to new information by altering the programming by which information is processed and evaluated. Argyris (1977) states that learning emphasizes a continuous cycle of experimentation and feedback in an ongoing examination of the way organizations go about defining and solving problems.

Senge (1990) notes that "organizations learn only through individuals that learn" (p. 139). In Senge's (1990) view, organizational success in the future will be determined by management ability to tap "people's commitment and capacity to learn at all levels of the organization" (p. 4). This thinking is consistent with an open and transparent organization that invites all levels to participate in resolving knowledge gaps.

Nonaka and Takeuchi (1995) point out that creating and exploiting knowledge within an organization revolves around the interaction of tacit and explicit knowledge and the transfer and transformation of knowledge between individuals, organizational units, and the surrounding environment. Explicit knowledge is contained in manuals and procedures, and this knowledge has been articulated and captured in the form of text, tables, diagrams and product specifications. Also, it is formal and systematic, offering product specifications, scientific formulas and computer programs as examples. Tacit knowledge is learned by experience and is communicated indirectly, through metaphor and analogy. It consists partly of technical skills that are "hard to pin down." It consists of mental models, beliefs and perspectives so ingrained that individuals take them for granted and, therefore, cannot easily articulate them.

Marion and Uhl-Bien (2002) articulate the concepts of Max Boisot on organizational learning:

Boisot (2002) argues that leaders in Western organizations need to rethink their views about knowledge and its function in organizations. Leaders who operate under conditions of justified true belief (i.e., facts that are perceived to be real) manage certainty; their knowledge is sufficiently standardized that it can be reliably converted to value (e.g., in the form of production, service, etc.). Those who function under conditions of true belief (i.e., possess an element of uncertainty) incur some degree of measurable risk; there is an element of uncertainty about the cash value of their efforts. Finally, leaders who function in conditions of belief (i.e., projections of what could be) deal with uncertainty. (p. 5)

Accordingly, Boisot states that managers tend to function comfortably in the worlds of true beliefs and justified true beliefs. In the business-processing operations of the organization, they translate mild uncertainty (justified belief) into certainty, or justified true belief. Within the organization, knowledge is codified as essential truths to the individuals and culture of an organization; this represents justified true belief. Within organizations, however, a focus on business processing and cash value tends to blind leaders to the need to focus on uncertainty, thereby short-circuiting the conditions necessary for fostering and maintaining innovation (Marion & Uhl-Bien, 2002). Management stuck in the functionality of justified true belief will not adapt to knowledge-management principles outlined in this study.

Organizational Learning and Knowledge Integration

Once knowledge claims are validated (McElroy, 2003b) or organizational learning has created new system thinking (Senge, 1990), new knowledge must become available to the organization. If new knowledge is not successfully integrated, the learning process is incomplete. Pfeffer and Sutton (2000) question why newly established knowledge frequently fails to result in action. The failure is the “knowing-doing problem,” a breakdown in the integration of new knowledge into the organization.

Although knowledge creation may be important, transforming knowledge into organizational action is at least as important to organizational success. “One of the primary reasons that knowledge management efforts are often separated from day-to-day activities is that the managers, consulting firms, and information technologists who design and build the systems for collecting, storing, and retrieving knowledge have limited and often inaccurate views of how people actually use knowledge in their jobs. Sociologists call these day-to-day activities working knowledge” (Pfeffer & Sutton, 2000, p. 29).

A study of 1,000 employees in business, government, and nonprofit organizations reported that “most workplace learning goes on unbudgeted, unplanned, and uncaptured by the organization and up to 70 percent of workplace learning is informal” (Pfeffer & Sutton, 2000, p. 30). Pfeffer and Sutton (2000) found that informal learning occurs “in dozens of daily activities, including participating in meetings, interacting with customers, supervising or being supervised, mentoring others, communicating informally with peers, and training others” (p. 30). The acknowledgement and capture of naturally emerging knowledge requires that leadership appreciate the dynamics of an optimal knowledge-learning environment. The optimal knowledge-learning environment captures knowledge that exists in daily interactions in higher education, and through open and transparent systems, informal learning becomes organizational knowledge.

Organizational Learning Problems

Organizations struggle with the creation and integration of new knowledge. Nonaka and Takeuchi (1995) inform us that management tends to treat knowledge as a

tangible commodity, something that can be counted or stored. Systems have no mechanism to disseminate or implement newly developed knowledge. The breakdown occurs when people responsible for this process do not fully understand the learning cycle or application of the knowledge. In other words, in the learning process, individuals can lose their understanding of the knowledge gap they seek to resolve. The solution gets lost during the integration transition. This problem must be resolved by leadership identifying removing barriers in the KLC.

Another problem identified in organizational learning is the tendency to *train* employees as opposed to challenging them to develop new knowledge. A recent study of 3,200 U.S. companies, conducted by Robert Zemsky and Susan Shamam, showed that a 10% increase in spending for workforce training and development leads to an 8.5% increase in productivity; a similar increase in capital expenditures leads to just a 3.8% increase in productivity (Bennis, 1999). Training may create skills; however, it does not enhance innovation.

Pfeffer & Sutton (2000) suggest that people and organizations could be trapped by their history. There are pressures to be consistent with past decisions, to avoid admitting mistakes, and to show perseverance. People have strong needs to resolve knowledge gaps, but decisions are made based on untested models of behavior and performance. People have expectations from the past and are limited by these expectations (Pfeffer & Sutton, 2000).

The process of increasing an organization's learning capabilities does not start by selecting a favorite consultant or by having a vision defining what the organization should become. It must start with an understanding of what represents the organization's present capabilities in both the performance and learning systems. It is this wrestling with the learning capacity that begins the steps toward increasing organizational learning (Pfeffer & Sutton, 2000).

Complexity, Leadership and the Learning Organization

McElroy (2003b) states that complex systems are learning organizations. Complexity theory is essentially a theoretical framework for knowledge management (McElroy, 2003b). In order to survive, organizations must find ways to interpret events to stabilize their environments and try to make them more predictable, and organizations must also find ways to interpret events to be one with the environment (Lissack, 1999). Complex systems are robust, involving multiple, often redundant interacting networks. They resist minor changes and are capable of adapting and adjusting (i.e., they become “fit”), resolving simple threats to their existence (Marion & Bacon, 1999).

Marion (1999) states that a fit system is one that is integrated into and supported by a significant number of environmental resources. Fit systems have accumulated significant amounts of internal resources and are part of a network of interdependent systems. Complexity theory challenges traditional management assumptions by noting that human activity allows for the possibility of emergent behavior (Lissack, 1999).

According to Senge (1990), the leaders goal in a learning organization is to “build organizations where people continually expand their capabilities to understand complexity, clarify vision and improve shared mental models – that is, they are responsible for learning” (p. 340). Leaders in a complex organization encourage

individuals at all levels of the organization to participate in organizational learning. Argyris (1977) states that leadership must encourage, recognize, and reward openness. The traditional autocratic control does not enhance learning in complex organizations. Leadership control limits the organization's potential. Instead, the leader invites "creative abrasion" (Leonard & Straus, 1998), an activity of organized disorder that challenges the norm in organizational behavior. Leaders are responsible not only for monitoring and encouraging the emergence of strong networks with other systems in the environment but also for monitoring and encouraging strong networks within their organizations.

Organizational success and organizational learning are intricately linked in the complex environment of the knowledge era. A study of organizational learning and the leadership role in enabling this process is valuable for understanding guiding principles outlined in recent research. The Knowledge Life Cycle offers a promising knowledge-processing framework to be applied to the higher education setting.

Design and Methodology

This study focused upon leadership and its role in establishing an environment conducive to organizational learning. It sought to identify policies and programs that either enhance or inhibit knowledge processing. In addition, it explored the leadership function that optimized organizational effectiveness with what has been defined as “knowledge gaps” in business-processing activities. An investigative strategy was employed; thus, clarification of study questions evolved as the study progressed. Data were collected through interviews, observations and secondary sources. The primary sources were semi-structured interviews with individuals in senior leadership positions in higher education.

Presidents and provosts from five different institutions were interviewed to comprehend knowledge management concepts in higher education and to apply the Knowledge Life Cycle against this setting. Once the framework of knowledge processing in higher education was established, leadership patterns that enhance or inhibit organizational transitions from business processing to knowledge processing could be revealed, and the process by which new knowledge is integrated into the existing business processing of the organization could be understood.

Processes were established by which new knowledge was developed and codified. These processes were discovered in patterns of behavior revealed by the interviews. A coding system was developed to analyze and contrast how knowledge processing was enabled or inhibited by leadership policies and programs. Further indicators that suggested knowledge gaps exist were identified, adding insight to the transition of these separate processes.

Interview participants were selected to offer broad leadership exposure of the higher education setting. Presidents and provosts were selected to maintain similar roles across institutions. Generally, the president, the senior executive, and the provost represented the senior academic officers of the institution. The sample reflected diversity in types, sizes and institutional missions and diversity in training and education of interviewees. For all participants, the single common element of the selected sample was senior leadership in higher education.

The preceding chapters presented the purposes of the study, the basic guiding principles underlying the approach, and the theoretical framework. The literature review revealed a limited number of ontological studies of knowledge management in higher education. Knowledge management in itself, at least in terms of second generation KM (McElroy, 2003b), has seen limited study. There has been little operational investigation on the dynamics of knowledge management, complexity theory, leadership and organizational processing in the higher educational setting. No inductive study of the higher education setting was found, suggesting the current research offered a significant contribution to understanding the Knowledge Life Cycle (KLC) framework.

The method and design of this study are the focus of this chapter. The population, instrument, techniques, and methodology for analysis are discussed and limitations of this study are provided.

Sample Selection and Rationale for Population

Higher education presents a complex organization with a variety of stakeholders and a mix of networks that lends itself to a macro study on knowledge management. There are pressures in higher education that are forcing self-evaluation and change. Higher education is adapting, and, as argued, is doing so in a process as reflected by the Knowledge Life Cycle.

Sampling

A major difference between quantitative and qualitative studies is the manner in which sampling occurs. Quantitative populations are typically large and randomly selected to assure population representation, while qualitative populations can be relatively small with subjects selected purposefully (Patton, 1990). In qualitative research, the researcher identifies participants who are knowledgeable of the propositions being studied; however, the participants may not be aware of the information the researcher is collecting. In this study, participants were selected based on their senior leadership role, geographic location, and willingness to participate.

Typical Case Sampling

Typical case sampling is a variation of purposeful sampling that provides a qualitative profile of one or more "typical" cases (Patton, 1990). It allows the researcher to draw conclusions and describe qualities and characteristics that are typical of the population. In this research, executives in higher education were studied. Although the executives serve diverse institutions and have a range of experiences, they were selected to represent typical higher education executives. Based upon the positions held, the executives are assumed to be successful and knowledgeable on issues in education.

Argument for Qualitative Study

Both quantitative and qualitative research strategies are valuable tools to researchers. The first step in conducting a study is to decide whether quantitative, qualitative, or a combination of quantitative and qualitative is most appropriate. After reviewing the literature and defining the problem, qualitative research was considered the most appropriate method. Direct interviews with executive leaders in higher education organizations provided necessary data to establish patterns and to draw valid conclusions from propositions outlined in Chapter II.

Kerlinger and Lee (2000) define qualitative research as "social and behavioral research based on unobtrusive field observations that can be analyzed without numbers or statistics" (p. 588). Qualitative research allows the researcher to make firsthand observations of the participant in his or her own setting without manipulating the variables being studied (Patton, 1990). Characteristics that are unique to qualitative studies include: concern with the process, interest in the lives of people, data collected by the researcher, and immersing the researcher into the population or research setting

(Creswell, 1994). To gather the necessary data, information must be collected from the field, sorted into categories, formatted into a story, and written as text (Creswell, 1994; Patton, 1990).

The literature identifies the following as advantages to qualitative research:

- The use of direct observations in the participant's natural setting;
- The identification and interpretation of social transactions and interactions between people and events;
- The less-structured process of data collection;
- The flexibility of the researcher to make adjustments during the study; and
- The ability to develop new hypotheses during the research process (Kerlinger & Lee, 2000).

Data collection in qualitative research is best served by direct observation. By being immersed in the executive setting, the researcher gathered reliable data that would have been impossible without such observations. General observations of the interview environment, including the reception of the researcher, body language, and the openness of the interview, enabled the researcher to better understand each executive's leadership characteristics. Also, having the opportunity to ask follow-up questions allowed for more accurate interpretation of the information.

The inductive method of research was chosen for this study. This strategy calls for research questions based upon phenomenological psychology (Giorgi, 1985; Keen, 1975), naturalistic inquiry (Lincoln, 1985), or qualitative research (Marshall, 1989). The research questions examined how people think, believe, and behave in a specific local time and place (LeCompte & Schensul, 1999).

Study Validity: Triangulation

Ensuring the validity of the study is an important element of qualitative research. Triangulation is one method of strengthening validity. Triangulation involves confirming the accuracy of data from one source with data collected from another source (LeCompte & Schensul, 1999). Strategies include using several different researchers, multiple perspectives for interpreting the data, and/or multiple methods to study a single problem (Patton, 1990). Triangulation strategies for this study included examination of existing documents to support and validate data collected in interviews. Prior to each interview, the researcher accessed the institution's web site to identify information that described the institution's community, demographics, leadership team, and history. Each executive provided a testimony of their academic background and history in leadership positions. Additional data on the organizational environment of each site was compiled through direct observation prior to and during the visit.

As patterns emerged, a second investigator validated initial coding of research field notes. Initial findings were shared with this experienced, qualitative researcher. A

brainstorming strategy was used to seek dissimilar perspectives of the data to ensure proper conclusions were drawn. Follow-up interviews cleared up misconceptions and validated conclusions.

Grounded Theory

Data were analyzed in detail through the use of grounded theory, a technique that requires data to be categorized by continuously comparing incidents until common characteristics emerge (Patton, 1990). Grounded methodology “takes the researcher into and close to the real world so that the results and findings are ‘grounded’ in the empirical world” (Patton, 1990, p.67). Each interview was transcribed, analyzed, and coded from patterns derived following the review of literature and development of study propositions. These patterns were subject to modification based on observations of the empirical data.

Initial categories were developed based on variables that represent leadership behavior in knowledge processing: (IBKP) inhibiting behavior- knowledge processing and (EBKP) enabling behavior – knowledge processing. Also, additional variables emerged that merited individual classification. In data analysis, the development of internal and external networks (N) was closely reviewed. Also, there was investigation of the origination and validation of vision (V) statements. An emerging pattern outlined indicator behavior (IN) that gave the leader recognition that knowledge-processing transitions were taking place. Finally, data were sought that were indicative of the use of leadership power (P) and control throughout these environments.

A coding matrix was developed and each interview was placed in a table format. Each section of the table was coded based upon predetermined patterns. Following initial coding of individual interviews, all transcripts were combined and sorted by code to further establish patterns. Patterns were identified through common phrasing and word choice that represented themes and consistencies across all data. The following coding designations and definitions were used in coding interviews.

(IBKP) Inhibiting behavior-knowledge processing. Actions and behavior by the leader which created an inhibiting impact on the ability of the organization to transition from business processing into knowledge processing or to integrate new knowledge and solutions into the business-processing environment.

(EBKP) Enabling behavior-knowledge processing. Actions and behavior by the leader that created an enhancing environment in the ability of the organization to transition from business processing into knowledge processing or to transition from business processing into knowledge processing.

(N) Network development and recognition comments. Recognition that different stakeholders exist in the environment and these stakeholders require attention in the processing cycle. Often these stakeholders are not integral to the business-processing environment but may become so as part of the validation to the epistemic gap solution.

(V) Vision. Indication that vision was a knowledge claim that required verification, testing and validation by shareholders internal and external to the organization.

(IN) Indicator behavior. A leadership acknowledgement of behavior that indicated an epistemic gap and a need to transition from business processing to knowledge processing.

(P) Power. Leadership willingness to collaborate with expertise outside the immediate group. The willingness to release power to enhance the knowledge-processing environment.

Using the pattern definitions, the set of transcribed interviews was evaluated. Some statements were not clearly designated in the coding matrix. In each case, the statement was copied and coded as appropriate. For example, if a statement reflected use of power (“P”) and was also a knowledge gap indicator (“IN”), the researcher copied the statement and coded each independently. This allowed for full consideration of patterns. In final data analysis and reporting, duplicate coded statements were intertwined with other similarly coded statements.

The study expanded when new information was revealed. The concept of identifying knowledge gap indicators was added following data collection. This information emerged from the data consistently, and the researcher made the decision to code it independently. The study expanded to accommodate this subject material. In verification interviews, this data pattern was reviewed carefully to ensure the data was correctly defined. The concept of knowledge gap identifiers (“IN”) was an emergent contribution to this study and was treated as a knowledge claim that was tested and validated in this manner.

Data Collection

In qualitative research, the researcher is the primary instrument for data collection (Patton, 1990). The quality of the product depends upon the researcher's ability to formulate questions that would produce valid answers and address the stated problems. Once the questions have been asked, the researcher must be able to analyze and categorize the response appropriately. A semi-structured interviewing technique was constructed. This interview was comprised of a series of questions; each was followed up with other questions to clarify or gather more information from the participant. Careful consideration was given to assuring that questions did not bias respondent opinions. This was accomplished by discussing potential questions with colleagues and testing questions in preliminary interviews. After initial interviews were complete, the researcher reviewed the data collected and revised the format of the questions as necessary.

Data were collected using the following process:

- 1) Review of internal and external literature confirmed the theoretic framework of the study and verified that there was merit to analyzing the research questions in the higher education setting.

- 2) A phone interview with Mark McElroy in July 2003 identified KLC strategies and study applications. The intent of this interview was to clarify questions and gain further understanding of the KLC and its potential application to the higher education setting.
- 3) Several pre-test interviews occurred to verify questions and study propositions.
- 4) Institutional internal and external documents were reviewed to clarify the mission and role of each of the study institutions. A key focus was to understand the business-processing role and lines and limits of authority and potentially to identify knowledge-processing inhibitors and enhancers that may exist.
- 5) Interviews with higher education executives established a broad understanding of knowledge processing in higher education. These interviews were based upon study propositions and sought to validate the KLC process.
- 6) Follow-up observations and/or interviews were held to verify and substantiate information as needed.

Inductive research aggregates specific and concrete data to create more general and abstract ideas about the composition of cultural scenes, social and physical phenomena, and explanations for why events occur as they do (LeCompte & Schensul, 1999). The propositions of this study were elaborated on and tested through continued collection and analysis of data. Data were collected until patterns began to be repeated. This process continued until information confirmed a stable pattern and the propositions of the study appeared to be complete. This process is referred to as grounded theory (Glaser & Strauss, 1967), domain and structural analysis (Spradely, 1979), and recursive analysis (LeCompte & Preissle, 1993) (Merriman, 1988).

The Interview Process

The primary strategy for data collection (step three and five in data collection) was interviews and direct observation. Interviews offered an appropriate method to obtain data directly related to study propositions. Respondents were asked open-ended questions that allowed them to relate to knowledge-processing issues and the propositions outlined. Probing questions were asked to establish details. Direct observations, involving all areas of observable human experiences (Patton, 1990), were drawn from interacting with members of the organization and analyzing of documents obtained during the study.

Initial contact was by email with each executive or their assistant. A brief description of the research study was provided, and each executive was asked to participate in an interview at a convenient time. Executives held the title of president, chancellor, provost or executive vice president (serving as the senior academic officer). No more than two people were interviewed from one institution. Each interview was scheduled for one hour and was audiotaped. Following the completion of all interviews, a thank you note was mailed to each executive. Later, a monetary gift to a local charity,

selected by the researcher, was given in recognition for participation in the research process.

During the months of November and December 2003 and January 2004, the researcher met with participants in their respective offices. To begin the interview, each participant was given a consent form. Participants were encouraged to ask questions about the interview process before signing and returning the form, and each received a copy of the consent form for their files. Following this, with their acknowledgement, the audio recording device was activated.

Two interviews occurred during the early defining period of the study. One was with Theorist Mark McElroy and was used to discuss the concepts of the study and to explore his work in knowledge management. In addition, this interview provided the opportunity to discuss in detail the Knowledge Life Cycle. A second interview with a college president was scheduled by the researcher during September 2003 and was not audio recorded. Field notes were taken and transcribed. Preliminary, pre-test concepts and propositions were discussed in these interviews. Research propositions and interview questions were refined to represent the research topic.

Following these interviews, the researcher was concerned that the quality of data would not be captured without taping the interview. Information was submitted to the Institutional Review Board to allow for interview taping, and in November 2003, this request was granted. A follow-up interview was requested and granted with one pre-test participant. This occurred in January 2004 with the interview being recorded.

In design, attempts were made to have a representative sample based upon several variables. The geographic location of the study was the southeast portion of the United States. A list of all higher education institutions within a 100-mile radius of the researcher's home base was developed, and representation was sought by size of institution and by public/ private funding. A "large" institution was defined as an institution with over 5,000 undergraduate students. A "public" institution was defined as an institution that received state allocations and was listed as a public institution in the budget of the respective state. All study subjects were professionals over 18 years of age with substantial experience in higher education.

Interviews had four sections. The interview began with an introduction to the study and request for permission to proceed. The second section consisted of a general introduction to the concepts of business processing and knowledge processing. The KLC framework was shared at this point. The third section of the interview consisted of follow-up questions on the study topic having a direct tie with the study propositions. The final section of the interview offered the interviewees the opportunity to openly share thoughts and concepts on the study topic. During this discussion, the researcher was able to gain deeper knowledge of issues and personal interpretations of current issues in higher education that were of interest to the individual participants.

In interviews, common patterns of thoughts emerged. These concepts and relationships brought fourth an ontological understanding of knowledge processing in higher education. As patterns emerged, a list of behavioral leadership patterns was established that either enhanced or inhibited knowledge processing.

Measures were taken to protect the participants in the study. To maintain participant anonymity, interviews were transcribed using the executive's initials and a pseudonym. All records were maintained in a locked file cabinet when not in use by the

researchers, and tapes were transcribed by a professional transcriptionist who did not know the identity of the interviewee(s). Only the principal investigator and the co-investigator reviewed transcriptions of taped notes. Following completion of the transcription, tapes were erased and following completion of the study, field notes and transcriptions were destroyed. In all observations and resulting field notes, no identifiers of individuals or institutions were used.

Limitations

To increase validity, the researcher must be aware of and address potential limitations and bias. The sample selection criteria for this study included institutional size and funding strategies. Specifically, this study did not address issues related to leader race, gender or national geographic location.

Data Analysis

The purpose of this chapter is to review leadership concepts in higher education and to summarize the data analyzed in this study. Data relative to the four propositions that were derived from the ontological discussion in Chapter II are discussed. As suggested in proposition 1, knowledge processing is shown as a continuous cycle revolving around the identification and resolution of knowledge gaps. Leadership behavior and decisions create an environment that enables or inhibits this cycle. This section will draw conclusions and suggest initial concepts emerging from the data.

Proposition 2 proposes that the emergence of interactive networks is an indicator that the organization has maintained an environment enabling the knowledge-processing cycle. Data supported the proposition that higher education seeks internal and external expertise and that senior leadership promotes an environment for these activities to emerge naturally. Data related to the use of power and control as a tool to enhance the knowledge-processing environment, as represented in Proposition 3, indicated that leader's use of power and control is a tool to remove obstacles that inhibit the knowledge-processing environment.

The discussion on leadership and vision, as espoused in Proposition 4, suggests that the act of creating vision is an emergent process involving all levels of the organization. A sound organizational vision creates focus for all employees. In this study, the data indicated that vision creation follows the knowledge-processing cycle and is an emergent activity.

The data has revealed one new question beyond the initial propositions: What are the indicators that suggest a knowledge gap exists? The data on this question will be examined in detail as it potentially reveals a new leadership skill specific to maintaining a healthy knowledge-processing environment.

Ontology

Ontology is a description of the premises and relationships that exist for an agent or community of agents within an organization (Gruber, 1993). This section begins with an examination of leadership challenges in higher education from the perspective of the senior leader. Simply, what concepts are of common concern to presidents, chancellors and senior academic offices? First and foremost, these leaders acknowledged that higher education is experiencing a significant transition in daily business-processing issues. Ontological concepts that emerged from the data are concerned with protecting the mission and future of the institution, identifying and strengthening relationships, and understanding the uniqueness of each institution in order to enhance learning. Finally, higher education institutions were introduced as complexity organizations. Significant indicators supported this notion and are discussed in detail.

Higher Education as a changing organization

The data revealed a pattern that supports the KLC premise that knowledge processing and knowledge sharing are the business of higher education. In interviews, senior executives recognized the usefulness of the Knowledge Life Cycle (KLC) as a

framework of how this process occurred. They also recognized that higher education is changing and that the ability to identify, validate and codify new knowledge is an essential tool for the transformation of higher education to meet the needs of a variety of stakeholders. One participant stated:

It is a difficult time in higher education. Higher education is in a major change period and, frankly, some people are not aware of this change or willing to acknowledge it. There are tremendous pressures from stakeholders that want to understand why tuition is increasing – why tax dollars are a wise investment – why their children have to take certain classes. We must be in a position to respond to all such questions. In fact, we need to mold our future in order to lead in these times – not just react.

Another participant furthered this sentiment by stating:

I think we are probably in another shift culturally in terms of what does higher education mean. We are not an institution anymore as we are a part of a fabric of life. If we don't keep getting educated [and] we do not re-invent ourselves personally, we get left behind. So, how do we [higher education] help people continually re-invent themselves at age 30 and 40 and even 50 and 60. The whole landscape has changed and institutions have not been willing to change with it.

Collectively, every interview participant recognized the changing landscape of higher education and the necessity of leaders to be aware of this transition. A leadership function is to identify and interpret trends. The interview settings revealed distinctive differences between institutions, yet this theme of change is a common issue for all. Influences identified as driving change in higher education included tighter budgets, changing expectations from a vast variety of stakeholders, and the emergence of a knowledge-based economy. The senior executive, as leader of the organization, must interpret the nature of change and how it impacts the organization. For example:

I want people to understand that at the end of the day committees don't get fired. Presidents get fired. But a smart president will listen to what people have to say and take recommendations and advice and then be willing to make hard decisions.

Trustees were identified as key stakeholders:

The role of the trustees was critical. It was essential that the president and chairman of the board of trustees hold the same vision and focus of the university. They must act as one. In addition, it is critical that the administration answer every question that a trustee may have – not only immediately but also with full information. If you have an active, engaged board that shares the president's vision, when the crisis times hit, you are speaking from

one mouthpiece. This is critical when the president wishes to change the culture of the institution.

Students, as stakeholders, have increased expectations:

I think that the students come to us now with a greater expectation of what they should get from their investment of time, money, and their own resources. So, I think as I consider higher education, I think one of the big changes is in the student population. We still get students who come to us who do not know what they want to do as a career. And these students may not be just out of high school. They may be in their thirties or forties, and they are still searching for their career path. But I think we are getting students who are more knowledgeable about career options, and I think this is because of all the work that is taking place in public schools. But we still have a lot of adults that are searching. Overall, students are better consumers. They want to get more value for their time and money.

Faculty and staff are seeking greater influence in the governance of the institution:

Probably the fact that most people who are employed in higher education have been taught to question everything. It is not just easy acceptance. The idea of a faculty is a misnomer. It is not a noun that is singular. It is a collection of individuals, each of who is an individual and that is why they are faculty because they want to be individuals. They do not want to groupthink. They want to think as individuals.

A common issue that the data revealed is a question that external stakeholders have asked of higher education, “Why don’t you run your organization more like a business?” Beyond the simple answer, “We are not a business,” ample discussion revealed the unique challenges associated with this management philosophy in higher education. One leadership function seemed to be the protection of the institution from an alien intruding culture, especially as questions emerged from trustees. One president stated:

Higher education is a very complex organization and typically he [the president] goes through the same routine with each new trustee. The trustee would state, “Well you’re the president; just tell the faculty what to do.” Well – it’s not quite that simple.

In addition:

Every board of trustees has one or more members that parrot that notion. We need to run it more like a business. And the answer is yes and no. We need to operate higher education in ways that are as efficient as possible for the nature of the enterprise. At the same time, we need to do a better job of communicating the distinctive nature of the enterprise. We are in a service industry. We are not

in a production industry in the sense that we are producing quantities of things that are easily demarcated and counted. And, unfortunately, I think more often than not, this cliché that higher education needs to be operated more like a business is coming from people who are looking at it through the lens of production-based industries, manufacturing-based industries.

There was recognition that higher education had a duty to define itself independently from the world of business. There was a need to respond to the criticism of limited accountability and to educate stakeholders on these important issues:

So, can higher education operate more effectively, not just for the dollars to be saved but more importantly for the benefit of the constituents that we are trying to serve? Yes. Should we pursue such efficiencies by mimicking what business does? Should we literally try to operate like a business? No. Because we are not a business. We are not identical to a business. Our mission, our purposes, our culture, our chemistry is fundamentally different. We need to view that difference, not as a negative as is applied in the cliché, but rather we need to champion its distinctiveness as a virtue.

Communication was considered key to resolving this concern:

Intellectual services, the development and transmission of knowledge are very different. It is virtually unique in its structure, its circumstances, its goals, and its delivery. And we do not do a good job as leaders of higher education in articulating those qualitative differences and distinctions to the broader public. And it does not help when we just adopt a sort of knee jerk defensiveness about those attitudes and those perspectives. We need to appreciate why people have developed those notions simplistic as they may be or naive as they may be. We need to understand that there is a context for that confusion (run it like a business).

Further:

The leadership role in higher education has additional challenges beyond the grappling with changing environments and calls for greater accountability. The leader must grasp the mission of the institution and establish clear expectations so that the institution does not “lose its way” in the changing role of higher education.

Mission and Change

Data suggested that the role of mission leader is important to study participants. In the changing higher education landscape, there are significant indicators that the organization must be true to its mission and focus on its strengths. One participant

captured this well in the following statement: “Focus is important to the institution. We must recognize that we can’t be all things to all people and by framing learning – learning is accelerated.”

In this environment, often the focus of the institution appears to be difficult to grasp. Respondents indicated that institutions are caught in negative learning spirals as opposed to positive, healthy cycles, as represented in the study framework. The negative patterns that emerged in the analysis are resistance to learning activities and entrenchment in historic decision-making patterns. A leader’s role is to break negative patterns and to establish new methods of organizational problem solving. Before the mission can be met, the negative environment has to be transformed into one that enables knowledge processing. Every participant saw value in an energetic knowledge-processing cycle as the backbone to organizational learning. Thus, a first step, represented as a fundamental change in culture, has to occur so that the desired environment can emerge. Respondents portrayed this transformation as a slow, systematic transition with many challenges to overcome. The following comments are representative of this notion:

I have said this 100 times publicly, but the thing that has struck me is that every one of those businesses has to re-invent itself every day or they go away. If they have to do that, how in the world can I think otherwise about us? So, I have said to our faculty and staff that we must continue to re-invent this college to make sure we serve the needs because the needs we were invented to serve don’t exist anymore. Therefore, we either change or we are irrelevant.

I relate the Queen Mary [changing direction of a large vessel] kind of a deal to the turnaround because you are changing culture, you’re changing people, you’re changing processes, and turning a culture around is a very slow process.

As another participant stated, significant change in higher education is inherently slow due to the nature of key stakeholders. This was not seen, in this context, as bad.

It’s a slow process. That’s why they always say that higher education institutions move extremely slowly, and it is because they move on a knowledge generating process, which is slow by virtue of the fact that we are all academics.

Clearly, the role of mission leader is important to senior executives in higher education, not only to protect the core mission, but also to establish an environment to meet changing internal and external conditions.

Future Leadership

Senior executives participating in this study were concerned for the future leadership of higher education. A tremendous transition in faculty will occur as baby boomer faculty members retire in high numbers. This void will create a unique challenge

and opportunity. New personnel could lead to an opportunity to relieve historic patterns and create a new culture in the organization. One participant stated:

There is a certain replenishing that goes on when people retire and people take other jobs or we create new positions. But it has also got to be a part of a new set of goals, a new vision, and not for its own sake. It has to have meaning, substance, and depth, or it won't be embraced. That kind of shake up is good.

Development of new leadership was seen as a strategic initiative. The leader role is to model the environment through careful selection of key team members. As shared by several participants:

We were trying to do too much with too little in too many different areas. Because, we are still working in the 1990's. We are not even thinking about 2003. So, we've either got to give the new young people a chance to think and forge a new future, especially when we are going to rehire a third of us, we have to be ready to do that! You can't let them be scrambling around to just hire people to replace us because you will end up with us again -- nothing will move. We will regenerate ourselves.

Also:

What do I need to do to bring some younger people along? Who am I going to train to walk in that door one day to take my place?

The primary answer to the question of future leadership rested upon existing leaders themselves. The role of quality mentorship was discussed repeatedly. Every interviewee shared a story of important mentors in their professional careers. For example:

Mentors are critical to leadership in higher education. I have had four that I trust implicitly. Not only do they each offer sound and honest advice on how I manage the institution, they share their perspectives on my well-being.

Another participant stated:

The point is that you never know when you are serving as a mentor for someone. Those mentors did not know that they were doing that for me but they did. I cannot point to one single one. I could list a hundred good people. I hope I am mentoring some people, the students in my class, the people on the leadership team, although that is probably 50/50. They are doing as much of that for me as I am doing for them. I hope that for students that is, in fact, the case.

Relationships and networks

Respondents reported a key ingredient in redefining the culture is the need to collaborate with all stakeholders to establish a healthy knowledge-processing environment. They discussed several factors relative to this, including the strength of inclusiveness, a culture of collegiality and cooperativeness, and a general sense of support for the mission and vision of the institution.

I have said to several staff and faculty members that my goal is to change the culture into more of an open culture, more of a participative culture, one that is customer oriented and student friendly, but customer oriented internally in terms of how we treat each other if we both work here. What I have said clearly is my goal is to mold and to shape the culture but if we have to break something first, we will break it.

Collaboration is essential in this environment. According to respondents, collaboration and strategic partnerships have become a cultural reality in higher education leadership. Collaboration and strategic partnerships at all levels of the organization are essential to cultivating knowledge networks that lead to enhanced knowledge processing.

We have been a good partner. We have to become more of an integrated partner with businesses and industry to make sure we are meeting their need. So, how is it going to change? I have said this many times in public that one of our continual themes is collaboration, collaboration, and collaboration.

Once the environment and culture set the stage of collaborative energy, the organization is equipped to approach knowledge gaps. However, as shown in the next excerpt, before the organization can enable a knowledge-processing environment, baseline institutional needs must be met.

Now, we want to change the focus from your discontent and your concerns to the issues of the institution. And we could not do that until we solved those issues that were very personal and why are they being paid more than I am? We had to answer those hard questions and in some cases we had to say, "That person should not be paid more than you are." We went through two years of adjustments and freezing salaries until we got everybody on par. Once everybody realized their lower level needs were being met, and then we could say, "Now we want you to concentrate on issues related to the institutions needs."

Community Involvement and Relationship Building

The data suggested that leadership considers strong community relationships critical to defining the institution. The institution needs a presence in the community. One participant stated:

We have to find ways to connect to the community and in a sense prove ourselves in some places, but to be a good service provider. This is not about punching the clock working here. A lot of what we do we can only do well if we connect with people in the community. Well, one thing that we talked about and that will happen is those faculty members in that division are going to be out there in the plants [community]. They cannot do their job if they stay on this property all the time. They have failed themselves and the students and the businesses they try to serve. So, we have said clearly to them: You need to get out there [community]. You need to talk about what they are doing. You might have some ideas and you know what? You might learn something, too, but you might help them in the process. So, I think that give and take you will see more of that. I want this more of an open community.

Organizational Learning Issues

Considering the issues and environment that lead to organizational learning was an important focus of this study. Learning came as a result of information sharing, risk taking, and an environment of open communication. Information in the learning process is accumulated through established and emerging networks internal and external to the organization. Several responses to the question, "How does your institution learn," follow:

We learn from the barrage of information we receive through the extended network of higher education institutions, noneducational organizations that we participate in and benefit from, just the larger general environment within which we operate.

We learn in the generic ways that any institution of higher education learns. That is, we learn on an individual level through our own innate sense of curiosity and professional motivation and through our own individual professional environment. That is, what we read as individuals, what we absorb through the media, through interaction with others, through our extended network of professional associations we learn. Then, from an individual level to a small group level, we learn through our interactions with each other, both formal and informal.

Communication, especially listening, was seen as a key to learning. In this example, clear indication that all employees can add value in the development of solutions is evident.

Well, how do we find a solution? I think we listen to the people. We have got a lot of smart people here and a lot of people that know their jobs. Just like manufacturing, some of the best ideas come off the shop floor. I think we have to be willing to take the best ideas off the shop floor. We really do. They add value, if you will. Our teachers and our student services people -- they add value just like our faculty.

Crisis can lead to an environment of learning. Unfortunately, as shown below, options become limited and the knowledge processing cycle can become stressed in a crisis environment.

We typically learn when we get backed into a corner and are forced to change on external demands. It is typically the circumstances under which we learn. I think that is unfortunate because then our options are usually limited. I think the preferable way for higher education organizations to learn is for us to do just like the business world and continually ask the question: How are we doing? Is it working? Is it not working? If it is not working, why is it not working? How can we make it better? Staying mission focused.

A role of the senior leader is to continually seek ways to improve the institution, and one means to accomplish this is to keep the organization focused on improving itself. An environment of continual renewal and self-evaluation expands the concept of knowledge processing beyond seeking solutions to knowledge gaps. Participants indicated that the status quo in a competitive environment is not acceptable and that the organization must continually seek new and better solutions to knowledge gaps.

My favorite question is “WHY?” I probably drive people crazy with that but why do we do the things we do? And, I think part of a leader’s job is to ask that question. Because I don’t think we change unless we ask hard questions. We change our habits if we have a heart attack or something else. That is how higher education typically changes because we can just do it. It is a systemic thing. But, I think we only change when we are forced to unless creative and visionary leadership is in place that says, “We either change or we go away.”

The ontology of higher education as a learning organization relies on the identification of gaps in the business-processing environment. However, knowledge gaps may be more than just business-processing issues in search of solutions. They may also represent existing policy and programs, without apparent error, that an insightful leader

would challenge. This observation led to a potential leadership role, that of one who challenges the status quo in all levels of the operation.

Continuous self-evaluation of policy and programs could be an essential environmental element to support knowledge processing as a seamless, transparent activity. Self-evaluation may identify emerging gaps that could erupt into a crisis condition, thus impacting the timeframe for effective knowledge processing. The worst case, as shared by one participant, is that “the stagnant organization that does not ask ‘why’ can disappear into the competitive landscape.”

Complexity

Higher education displays many attributes of a complexity organization. Complexity theory suggests that complex organizations adapt with emergent behavior to meet changing needs and external influences. The Knowledge Life Cycle framework is based upon complexity theory and supports the position that organizations are complex adaptive systems (McElroy, 2003b). Complex adaptive systems exist at the edge of chaos and seek emergent solutions to disruptions in the day-to-day activity of the organization. The data identified complexity behavior in higher education.

An essential indicator of complexity organizations is the need of all agents to be involved in the resolution of knowledge gaps. This “bottom-up” activity assumes that all levels of the organization are welcomed and involved and that the result is a high level of interaction. For example, several comments were:

Goal setting it was a ground-up process, established a plan through strategy, and the goals grew which basically reshaped and redefined the University.

Also:

We try to encourage everyone to try to be interested in and engaged in and participate in every aspect of campus life, regardless of the particular job title or their seniority. So, it is top down in that we expect the senior management, the senior staff to generate ideas, and to foster innovation. Yet, at the same time it is bottom up in that we try to do the same thing at every level of the organization, whether it is custodial or groundskeeper or maintenance people.

Also, the data supported complexity theory in suggesting that social networks are essential in the resolution of knowledge gaps. This premise leads to the consideration that all levels of the organization participate in developing and testing solutions.

What we try to be is cross functional and institutional oriented rather than defining ourselves in separate boxes. Now, to be sure that is not easy. It is much harder to have that culture to create it, to sustain it, to nurture it, than it is the conventional hierarchical top down, or the conventional bottom up where you are just waiting for everything to come from others. So, as I say, it is not

either-or. It is aspects of both and we hope it is the healthy aspects of both without the negatives.

In addition:

Well, we do that by again encouraging every vice president, every supervisor that whenever they have meetings within their staff context they continue both directly and indirectly to encourage, foster, and reward suggestions. Re-engineering ideas, or simple things that can either save money or streamline processes, or reduce expense, or generate revenue, or improve morale, or improve communications. So, again we create that institutional cultural goal. And then we try to permeate the institution, the organization, the staff with its premises and its practices. So, there is a cultural context within which that is fostered.

Knowledge Gap Indicators

The ability to identify knowledge gaps is a critical leadership skill. Once identified, the leader analyzes the components of the knowledge gap to determine potential threats to the organization as well as strategies to resolve the gap. Key questions are answered once these concepts are understood. For example:

- What are the dynamics, internal and external that led to this knowledge gap?
- How will this gap impact an organizational goal?
- Does this gap suggest that the organization has deviated from its mission?
- Are there barriers to the knowledge-learning cycle? If so, are there strategies to remove these barriers?
- What resources are necessary? Internal and external?

Business processing represents the daily concerns and operations of the organization. When business processing is disrupted, some form of knowledge gap exists. A problem develops that must be attended to before the business processing can return to maximum efficiency. The leader must have a sense of the organization and know when a gap exists. Interview discussions on “how do you know when a knowledge gap exists” brought substantial discussion and reflection. Some examples of knowledge gap indicators are:

Sitting around and scratching our heads and not getting anywhere and not using talent on campus was not productive.

You could tell that instinctively when that would take place. You would see the energy level drop and the leadership team would have somewhat of a reptilian glaze over their eyes. So that would

be when he would recognize, as leader, it was time to bring in outside expertise.

A lot of people came through that door and resigned. There were a lot of good people who realized they just couldn't do the job and to their credit said, "I'm just way over my head here. I don't even know what you're talking about."

Just a tremendous amount of conversation that was not going anywhere.

Circular conversations, just bringing up all the problems but offering no solutions. Yeah -- when everything is stymied and nothing is coming.

Once a gap is identified, there is a need to understand the dynamics taking place within the organization. The leader must first grasp the impact of the gap upon organizational goals. In some cases, gaps were numerous:

And so you put that all together and I guess in organizational theory terms it was a mess. Our challenge was to take all of these issues and try to begin to work our way out of those and go through the process of discovering what those solutions were and implementing them. Our challenge was to identify all the issues that were on the table in the language of this day that were not being resolved for one reason or another and just identify those problems that needed resolution.

In other cases, the gaps were less severe.

Sometimes we will find that we cannot fix it because of something we do not know and then we all sit there and say, "Okay, can you bring so-n-so into the next meeting."

Once the gap is recognized and placed in context, the organization began the process of identifying solutions. One key component to this consideration is whether there are suitable internal resources and expertise to resolve the gap or if external resources are necessary. In either case, the organization engages the Knowledge Life Cycle, and the process of identifying and validating knowledge claims begins.

Internal solutions rise from involving the organizational community. In this example, a solution emerged from a faculty member who was not part of the decision-making team.

Part of the learning is just what we were describing in coming up against something that we did not know we had or didn't know how to resolve and backing off of that. But part of it also comes from exposure to different ways of doing things and the conclusion that that might work better. Here it has come at cabinet level or from a division chair or it can come directly from faculty. Our

biggest institutional change came, since I have been here, came at the instigation of a faculty member.

Additionally, gaps emerge that require expertise external to the organization. Once a leader identifies the existence of a gap that requires external expertise, the leadership role is to seek appropriate resources. Often, there is an internal process that leads to the realization that external expertise is needed.

As we started talking to each other and brainstorming about some of the things that we could do, as people asked different questions. The people who worked the most closely with our partners, the response would be: I'm not sure about that or I really don't know how that works or we probably need to check that out. And so as I would listen to the responses, I would say, "Okay that is an area that we have some idea but we are not totally sure. We cannot afford to get into working with our partners unless we really know what their needs are from their point of view." Because it is a new venture, we have had no prior experience with such a project; no one on the senior staff would be characterized as an expert in this field. In this particular example, that awareness was self-evident as we initiated these discussions among ourselves as a senior staff. It was readily apparent that none of our staff members had sufficient understanding of, experience with, expertise in [of this type] development and management to provide meaningful and reliable and verifiable insight into this possibility.

Leader identification of knowledge gaps is essential to the knowledge-processing activity. An inability to recognize gaps leads to or allows for the continuation of unproductive behavior and frustration within the organization. Circular communication and decreased energy are clear signs of a broken system. By maintaining a focus on indicators and an enabling environment, the leader can promote an effective Knowledge Life Cycle.

Knowledge Processing in Higher Education Institutions – Proposition 1

The Knowledge Life Cycle is an environment in which effective interaction between business processing and knowledge production is constant, seamless, and barrier free. Leadership influence in the organizational environment as it relates to the cycle is the primary focus of this study. An "enabling" environment creates open conditions in which policy and knowledge gap evaluations occur. As knowledge gaps are identified in business processing, there is an indiscernible transition to knowledge production. Once solutions are tested and validated, this same seamless transition occurs, integrating new knowledge into the business-processing environment of the organization. The data revealed that the environment could be enabled and the knowledge-processing cycle enhanced. Leadership is essential in this process:

We had to change the culture of the institution. We had to establish a cycle of learning and striving for success based upon

our focus – instead the institution was in a downward cycle. So, that environment, even though it's not desirable, is not necessarily a bad place for leadership to begin to emerge. So, the process that we needed to do was exactly what people were hungry for. They wanted to engage in solving the problem but have been caught in this spiral.

In a dysfunctional setting, barriers exist within knowledge-processing activities that inhibit the relationship between these functions and obstructed organizational learning. At the discretion of leadership, barriers may or may not be removed. A variety of barriers “inhibit” the seamless transitions shown in the Knowledge Life Cycle, and a role of leadership is to identify and remove barriers to enhance this cycle.

Enabling Knowledge Processing

An important leadership role is to acknowledge the need for an environment in the organization that enables barrier-free knowledge processing. Ultimately, leadership must establish an open and transparent organization that will engage all levels of the organization. Consistent with complexity theory, this requires that leaders release traditional forms of decision making to workers to enable the KLC to function effectively. One participant supported this notion:

Our style has changed a little bit. There are issues that still bubble up to the surface that we have to deal with that I would call micro-issues, but our tendency now to shove those back into the system is kind of our operating routine now. Now we are gently moving those issues back down into the organization.

However, there was some tentativeness in relinquishing control to networks within the organization. It seemed important to enhance networks by ensuring a balance of skills and experiences. A complexity scientist would suggest that necessary skills would emerge naturally as they are needed. Participants felt that the leader should maintain some direction in this process.

The other thing that I think is very, very important when you put a group together is that you look at the learning modalities of the people who are in the group.

Even further:

I hope I have got a pretty good idea what the solution is before I break something.

Enabled through an established foundation

Before knowledge processing can take place, core issues in the organization have to be resolved. The environment has to be tuned in a manner that recognizes and welcomes knowledge processing. This includes a clear understanding of mission, correct

placement of personnel, and a sound policy base. However, the first step in this process is gaining a grasp of the current situation. On occasion, the organization is “broken,” calling for a complete reestablishment of the learning environment. For example:

In terms of what happened when we came, our first three months probably, we spent in doing nothing but identifying issues. I personally sat and we interviewed every level, every component of the institution and did nothing but say, “What are our current threats and what are our current weaknesses?” We did not talk about strengths. We did not talk about opportunities. We said, “What’s broken, what’s leaking, what needs to be dealt with?” The question was, “Where do we start?” The key leaders on campus spent considerable time in a darkened room working through these things and divided them into the urgent, the necessities, and this can wait until later.

This process takes different forms. The respondents stated that the essential ingredient was openness to testing and validating solutions to knowledge gaps. An essential leadership role is modeling this openness for other people in the organization.

We sometimes devote staff meetings solely to new ideas and out of the box thinking. We have no idea. We come in and brain storm. We do that sometimes by bringing in catalytic figures or consultants or speakers or peers or counterparts from other institutions and organizations. We do it through formal site visits, going to other places to do that. So, we try to create a culture of innovation, a culture of curiosity. And we do that by modeling that behavior ourselves and rewarding that behavior formally and informally.

From these efforts, a plan emerges. Clear priorities are the foundation of the plan. The plan was not to clarify solutions as shared by this respondent, but to establish a foundation to build future knowledge-processing activities.

Oh yeah! There is definitely a strategic plan. There is definitely a plan, there is definitely a series of things that we know we have to do in order to move forward, and we don’t move off of that. Within that context now we can talk about these things that we have to deal with. You know, so there are things they know will happen no matter what happens. I think that if you didn’t have that framework for this it would be very difficult to have a leadership style that is participatory.

Planning gives the organization a basis to work from, providing general direction and structure. However, true to knowledge processing and complexity theory, even solutions that appeared correct would fail. This simply offers an opportunity for the knowledge-processing cycle to identify and test new solutions.

But the other thing is, again, you learn from your mistakes. Nobody's going to be perfect. But if turning it around and admitting you were wrong will fix something and make it better, then for gosh sakes, admit you're wrong. Okay? In other words, you reverse your decision because you have learned.

Enabled through external networks

The data consistently recognized that organizations rely on external expertise when knowledge gaps exist. External participation brings added quality advice and collaboration from external stakeholders. A variety of strategies emerge:

One of the things we did was to visit comparable colleges and universities. At the same time we were doing that we began conducting focus group interviews and surveys with the relevant people in the community. While those external sources of information, expertise, experience, and insight were being developed and connected, we were continuing an ongoing series of formal and informal meetings and conversations on campus with a more extended group of staff and to some extent faculty and students. We also included in that conversation major constituent groups of the university including both our board of trustees and our advisory council, a larger group of approximately 75 corporate executives, government officials, civic leaders, and professionals from around the country that meet twice a year on our campus.

Enabled through personnel

According to respondents, the knowledge-processing environment was enabled through personnel that supported the focus of the institution and welcomed the openness and transparency of the Knowledge Life Cycle. The data confirmed that identifying and placing key personnel in appropriate roles was a high priority. Collins book, *Good to Great* (2001), was referenced in support of this principle in several interviews:

We prioritized issues and really for the first year focused on the urgent. We had a lot of personnel changes that first year because we did not have the problem solvers in the seat. In the language of the Good to Great (Collins, 2001) kind of thing, we had the wrong people on the bus, we had people in the wrong seats on the bus, and before we could do anything to solve the problems, we had to have the problem solvers in those places.

In addition:

You know, there is a very popular management book out right now called Good to Great. And he has a very simple echoing refrain in that book, and that is that the most important thing that an

executive does is to get the right people on the team and wrong people off the team. And I often tell the senior staff that what I want from them at that level is commitment to the institution, expertise, energy, and independence. That is, the ability for them to operate effectively without my needing to look over their shoulder. Obviously, with a senior team of a dozen people each of them is going to have a different mix of those attributes.

Through the Collins text, participants identified key attributes of senior leadership. The ideal team in higher education, as reported, needed to be properly assigned to enhance the learning environment and important attributes were commitment to the institution, expertise, energy, and independence. Maintaining an open invitation for all personnel to engage in the process is a second area of consideration that respondents identified. Concepts that were shared include formal suggestion and reward systems to all stakeholders to offer assistance. One respondent stated:

We have a formal suggestion system, we have a formal reward system, and we have a formal bonus system. So, we are trying to build into our incentive programs this same cultural systemic organization wide commitment to innovation, openness, and candor. To be sure, it is not seamless.

Probably at the very lowest level I am kind of a stickler if you see a problem, own it. It doesn't matter if it's your problem or someone else's problem. If you see a student or a family wandering around campus that looks lost and doesn't know where to go, own that problem. Help them. Don't just assume that somebody else is going to. If there is a failure in one area of the campus, it affects us in all areas of the campus.

Enabled through communication

Effective communication is required at all levels and by all stakeholders in order to enhance knowledge processing. This communication concept appears to have several different formats. Initially, senior leadership seeks strategic individuals who can share and distribute information to different constituents. In one example, a president created a special network of institutional leaders to keep critical information available at all times. This communication strategy clearly represents a social network developed for the purpose of sharing knowledge and engaging in the knowledge-processing cycle.

I created a group of informational leaders. These are people who I know will disseminate information and share openly with me issues and concerns that exist within the organization. It is not made up of supporters; in fact, I attempt to find dissenters so that I have their objections close at hand. These groups offer networks of communication that I could not achieve on my own.

In addition, respondents valued the communication process with employees. High levels of communication are seen as problem-solving techniques and reflect the open nature of the cycle. Employees and other stakeholders need to have a clear understanding of challenges in order to contribute to the identification and validation of solutions. For example:

We presented to every employee a very thorough presentation of the current situation financially, organizationally -- and gave them an outline of the direction we were going.

But quite frankly it is the information sharing [with employees] that we do. We actually work at those meetings. We will take policies and work through the policies.

Enabled through clear policy

Respondents stated that clear and consistent policy within the organization enables the knowledge-processing cycle. Clear policy establishes a baseline for identifying knowledge gaps. Policy also establishes business-processing consistency for the organization so that stakeholders have a base line for interacting within the organization.

Guiding principles were important. The establishment of guiding principles allowed the entire institution to understand what the issues were at hand and how we were going to approach them. So it demystified the entire process.

Having clear policy brought clarity to the business operation:

We have a pretty good policy base now. We have pretty good personnel policies and academic policies and so a lot of those issues that used to come to the table that would send us back into that cycle we did that. That has stabilized to some extent.

In addition:

Having clear policy has helped. Having many of the issues now that used to come to the surface don't, which is allowing me and our cabinet to go from really micro-managing/micro-leading to try and help people through the process.

Clear policy gives the entire organization guidance in the knowledge-processing cycle, clarifying roles and empowering individual action. Policy gives employees direction and confidence in participating in the business processing of the organization.

When you have policy, this process can go on at the very lowest level. So, if you have management level people or sub management level people, policy will help them to do this process without having to send it. People know what the expectations are.

They know generally what the decision will be if they ask someone to make it for them.

A good policy base allows for multiple functioning knowledge-processing cycles to occur within the organization. The cycle is distributed throughout the organization, not just at the senior level. A stable base of policy offers structure in processing cycles that supports the mission and focus of the organization.

So, we were kind of functioning as the committee as a whole to try to fix the problem at the same time while we were dealing with leadership issues and whatever. Now the policy issues come to the table now really only after this process is finished. And like any other organization, things come to the table from the various vice presidents that may be incomplete, have not been thought through, have not had all of the input, have not had this whole process.

Changing conditions in the environment impact policy issues, and policy review is an ongoing example of knowledge processing. However, overly strict adherence to policy could be detrimental to organizational learning and knowledge processing. An environment of burdensome bureaucracy and inflexibility can become a barrier to the seamless transitions necessary to knowledge processing. The data suggest that a leader role is to balance policy matters and reduce historic bureaucracy in order to encourage consistency and openness. Also, leadership controls the process of committing the organization to action. If this “power” to commit the organization is strictly controlled, the knowledge-processing environment is negatively impacted. A sensitive balance must be maintained.

Inhibiting Knowledge Processing

An inhibiting environment is defined as any environmental condition that delays or stops the seamless transition of the knowledge-processing cycle. A barrier could be deliberate restraints placed by leadership, indicating limited value in this process, or it could be a barrier that naturally or historically exists within the structure of the organization. For example, lack of awareness on the value of an open environment would reflect a leadership barrier. One participant stated, “Well, you can always hurry things and if you hurry them then haste makes waste is the saying, I guess.” This suggests that the need to make decisions in an autocratic manner undermines the value of knowledge processing. Another leadership induced barrier is a basic distrust of new ideas. If the leader does not welcome change in the organization, then no invitation to examine issues exists, leaving staff frustrated.

The most frustrating was a situation where I was not able to use anything I knew much. I have run into a couple of those where there was resistance at the leadership level to any new ideas, and that was probably particularly when they had to do with student learning.

As previously stated, clear lines of communication enabled knowledge processing. Contrary to this, filtered information is a controlling mechanism that negatively impacts the environment. In one example, there was concern that information was filtered before the senior leader could review it. Filtering resulted in lower confidence in the knowledge-processing activity.

So, many faculty and staff felt like whatever conversation they had and whatever decisions they may have made got filtered before they ever got to the president. So decisions were made before the president ever had a chance to know all the options or all the conversations.

Respondents identified autocratic leadership as an inhibitor to the knowledge-processing cycle. Without the opportunity to examine knowledge gaps and establish networks to test and validate solutions, organizational staff is left uncertain of their role. In a top-down organization, little need for knowledge processing exists.

I think too much of it has been top down. I don't think that we have any disagreement on campus with anything that the president has proposed or states as a vision. I know that there is some feeling that he too often makes statements himself and phrases them his way and sets goals and says, "This is what we have agreed on," without discussion.

Examples were shared indicating that control of decision-making authority stifled the open process called for in knowledge processing. Respondents perceived that openness led to abuse. A lack of centralized control led to an unfocused organization where "everyone was defining for themselves what the institution's expectations were."

I think our current situation compared to the previous one was that the previous cycle everyone had the authority to make policy. Down to the hourly level person who decided what their job description was, what they would do, and what their expectations were, and all the way up through the system. At that point, everyone was kind of defining for themselves what the institutions expectations were, etc.

Inhibited due to broken systems

Organizational barriers exist in the form of broken systems. The data revealed that before an environment enabling knowledge processing could be put in place, a base level of operation must be sustained. While not ideal, autocratic control was reported as a necessary means to establish the baseline knowledge-processing environment.

One of the inhibitors that are probably there right now is survival. We are in a survival mode that we were not in five years ago. Over the past four years as the budget has gotten tighter and tighter

and tighter, it is interesting. There is probably less desire to be magnanimous and to help somebody out and yet I find they are doing it more.

Another organizational barrier is uncertainty about resources. In higher education many organizations depend upon state funding. In recent years, this funding has been inconsistent and depleting. According to respondents, it was difficult to establish an environment without some base of certainly on external funding. One participant stated:

Well, you don't know what the environment is. I would have to tell you that I think in the last four years we have never gone into a year and come out the other end of the year with the same budget. There have been cuts in the middle of the year, you are at a point where it is anyone's guess what's going to happen. It is very difficult on academics because I am now getting questions about do we stop searches, do we start searches, do we get lecturers go, do we keep the lecturers? Are we going to have a small curriculum? This is not something you can turn off in July so that you can keep it off in August. The things that get processed in academia occur about a year ahead. So, you are sitting there trying to guess: "Will we have a budget cut, won't we have a budget cut?" I think that is the most frustrating thing for any of us. It is guesswork.

Inhibited due to lack of policy

Respondents identified a lack of policy as a barrier to knowledge processing. Limited and unclear policies lead to confusion and inconsistency, leaving the organization incapable of functioning properly, especially in personnel matters:

We didn't know why people were being paid what they were and that was kind of mirrored all the way down through the system in that it was a very reactive type of environment. They were reacting to problems but in that downward spiral situation. You can't react quickly enough because the other part of the model can't work quickly enough to make good sound decisions. So, things were just left.

Inhibited due to communication gaps

The data demonstrated that a pattern of poor communication was detrimental to an effective knowledge-processing environment. According to these comments, technology could become a mechanism to hide behind, leaving the organization stifled.

You know, I think in this great age of technology sometimes people want to send an email instead of picking up the phone and talking to somebody. And you can send emails and that is an efficient way... in some ways I don't always say that it is

communicating because if I am just telling you something I may not really be communicating with you. I am sharing some information but I don't have the benefit of hearing your questions. So, I think what we have to encourage people to do is to take time to listen to other people, to talk to them, and getting to know them is critical.

In addition:

On our campus, we are fairly small. But at the same time we spread out and so I am always amazed that someone who has been here for several years and I may be in a meeting and I realize they don't know each other and always say: How could you be on this campus and not know each other?

Inhibited due to resistance

Staff resistance to change was the most discussed inhibitor to knowledge processing, including passive resisters who prefer previous methods of operation and do not welcome a new paradigm.

Resistance -- I guess the interesting thing is there were a lot of people who thrived in that old environment in terms of where would resistance come from? The ability to make your own policy and the ability to function in your own arena is a very comfortable thing for some.

Also, there were active resisters who sought methods to resist a new environment.

Right then, we had the problem "creators" in many cases. So, to go to somebody who created the problem who had no idea how to resolve it, you cannot go back to that person in some cases and say, "Now fix all the problems you created."

Active resistance came as a result of new leadership that required a period of adjustment.

I probably went from the first six months wishing I had a suit of armor to go into those meetings -- I hated those meetings. I would walk in and there were sometimes I wanted to push back from the table and laugh. It was like watching a Laurel and Hardy film with people showing out and trying to one-up each other. You just had to let it ride and realize that, "Okay children, you are not going to get your way. You know, I am going to watch you act out, watch you do what you want to do, and work within your old framework, but that old framework is not going to work anymore."

Resistance also resulted because of too much to do:

Well, I think that is always a possibility within a team that someone is going to say: I don't think we ought to take this on, or

whatever. I guess my role, as the team leader is to recognize that people do feel somewhat overburdened at times and they cannot quite see how this is going to benefit them. And so my role as the team leader is to encourage everyone to think that this is an opportunity and to remind people that our mission is to work with our partners, either business and industry partners, or public school partners, or other groups in our community and to provide them support.

It could have moved a little faster had I assigned some of the “pulling this together and developing initial statements” to somebody else. But I did not have anybody I felt comfortable doing that with because of his or her loads. There were people who could do it, but they were already carrying such heavy loads.

A reported inhibitor was having the wrong personnel placed in the knowledge-processing environment. The healthy dynamic of emergent networks is compromised by the inability of the group to function in a creative environment.

It is my perception that this group very much liked controlled conversation. And given the personalities, I did not feel that the conversation could go very far. I had had enough indication already that we would get more of the same. Call it instinct, call it whatever, call it being a pretty good reader of persons, but I just did not think we had the right people around the table having the conversation.

One participant stated that individuals would agree that knowledge gaps existed; however, they did not feel compelled to participate in identifying solutions. The status quo is an easier, safer route.

In terms of resistance, it is kind of like blowing the whistle on the Titanic. There are some people that just like to blow the whistle. It didn't matter if the ship was sinking. They just loved to blow their whistle and do whatever they did.

Finally, one measure of resistance came from a surprising source – success. It is possible for organizations to feel as though there is not a need for examination or to engage in knowledge processing. The leader role is to challenge this type of comfort. The organization loses its edge and slowly, perhaps, begins to become less effective, complacent, and finally becomes “deadwood.” One respondent shared this scenario:

Everything was sort of high energy, doing it for the first time. Just incredibly like we could do anything. Anything was possible. It was like having a sheet of paper rolled out and nothing was on it. Everything was possible. I found myself walking through that school when everything was humming right along, everything was sort of smooth and everybody was doing good work and there was a sort of smile on everybody's face; that is when I got worried.

That we had become kind of institutional. Had become stable, comfortable, and so on. Usually the prescription there for me, and the faculty hated me, we would stop what we were doing. We would spend about two weeks doing something completely different, whatever it might be. And it was up to faculty and students what that would be. It was a breaking of the pattern. That idea of knowing when it is time to break a pattern, take a chance, of not being fearful. You know, the biggest thing to fear is the fact that everybody was comfortable. So, it is something that I think that you can learn. It is not that they were lazy. It is that they were settling in and most of the people thought you've got to be an idiot to shake this up. This is what you are striving for. No. What you are striving for is something fresh, new, beyond that. And that if you don't break that pattern, then you are going to fight. That condition I am describing was one step ahead of becoming complacent, which is one step ahead of being sort of deadwood. You don't ever let it get to that stage.

Solution Integration - Identifying success

An important question for leadership with respect to knowledge processing is, when do you know when the organization has successfully completed the cycle? Instrumental to this question, when does the organizational environment achieve an open, continuous, seamless knowledge-processing cycle? One indicator of achieving this plateau is a change in the expectations of the leader. In one example from the study, a healthy environment was one that functioned well, independent of the leader's direct involvement.

I know when new knowledge is integrated when I no longer have to come up with the questions. This tells me that there is a healthy knowledge cycle and issues are being addressed at the appropriate, lower level of the organization.

In addition, the vision of this organization was being met as a result of good solutions being introduced to resolve gaps. Increased participation in organizational challenges and a willingness to take risks were further indications that the environment was healthy. Good things were happening as a result.

Indicators that faculty and staff were "getting it." SAT admissions scores increased annually, the value of athletics was not only seen in wins and losses but in things like graduation rates and community outreach. Faculty were willing to reach out and take risks. Donors step forward and financially support the institution with endowed faculty positions. Faculty, while still critical, are looking for solutions – not just sitting back and criticizing the leadership of the institution.

Networks – Value of Networks

One continuing pattern the data revealed is the need for knowledge processing to be a collaborative effort engaging all levels of the organization. The strength of knowledge processing rests upon the successful integration of social networks. Networks are made up of a group of individuals who share common and diverse backgrounds dedicated to the resolution of a knowledge gap. McElroy (2003c) states this well.

I think these communities or networks—pick your term, it doesn't matter to me—are beautiful illustrations of knowledge processing activities. When these communities are active, they are not engaging in business processing. They are doing something else. They are either producing knowledge or sharing knowledge, none of which are the same as using knowledge in the business-processing context.

However, as one participant stated, “Collaboration is one of those things that are easier said than done.” Participants discussed issues of control, protection of turf, and lack of trust between colleagues. For knowledge processing to succeed, leaders have to open the learning process to make it transparent and inclusive. By doing so, an environment is created that welcomes participation. The environment must welcome the participation of “tacit” knowledge holders. Unfortunately, on occasion the initiation of networks came as a result of a crisis. In the eyes of several participants, this was a prescription to disaster. For others, it achieved a basic purpose of uniting the organization.

Crisis is a great teambuilding foundation. You can really build team in the middle of crisis. It is one of the advantages of going into an environment and an organization that is in crisis because the call for leadership is so powerful. You tend to get that kind of cooperation and support and involvement and engagement because the building is on fire and we've got to put the fire out.

The primary benefit of crisis planning and network formation in knowledge processing is the team's opportunity to collaborate.

They are playing together. They realize the sum is much more important than the parts functioning if the whole does not function. But, that is part of the knowledge generation. The way you generate knowledge in a team is going to be a lot different than if I had people sitting out there as individuals who never came back to the table for the conversation.

I think every person has got to understand their role and how they fit into that bigger picture. And no one person can do it all. We all have roles. We all have our own strengths. I do things differently than other people. They do things differently than I.

Leader role in network development

A primary leader role is to support the creation and application of networks to examine knowledge gaps and, secondly, to identify and remove barriers to network development. The collaborative nature of healthy networks allows for a free interchange of ideas. Trust and openness are essential. One participant suggested marriage as an example.

It is really important to me that they understand that it is like a marriage. There are sacrifices and there are gains. You don't always gain. And sometimes you will gain by sacrificing to somebody else and that is what a team is all about.

The strength of organizational networks is much larger than individual relationships; it is a collusion of multiple roles and expertise bound together to strengthen the organization. Once individuals learn about each other and the respective roles each has within the organization, the sharing of tacit knowledge is enhanced. Based upon the following comment, openness and trust seem to be the foundation of strong networks.

I think you have to develop two things. I think you have to develop the relationships, definitely. Before the relationships come you have to have simultaneous with that the understandings. And those are understandings of how each other function; you have to understand each other's college, each other's positives, negative, each other's shortcomings, and each other's capabilities. And that is a socializing event, I guess. They have to be together around a table enough to recognize what is going on and you have to be given enough information to put the whole picture into context, okay?

An additional key ingredient for healthy networks is diversity. Agents in the process need different backgrounds, training, and experiences in order to establish a well-rounded perspective. One participant described this as an intentional action.

If I am putting a team together to study something or to write a grant or something, I will try to construct it with people who I know have a mixture of all those capabilities. You don't want a team that is all the same. That would be death! You know, I welcome diversity [as a leader] because you play their strengths and weaknesses off on one another. If you had everybody the same you would have a disaster on your hands. It would be awful.

Networks

As healthy networks develop and the Knowledge Life Cycle is enhanced, success in dealing with knowledge gaps results. Gaps are not feared or seen as deterrents to success. At worst, they are seen as obstacles and in many cases as opportunities to redefine and enhance the success of the organization. Success statements by respondents

were made indicating that healthy networks in a strong knowledge-processing environment contribute to the organization. Several examples illustrate:

Over time people began to see the process working and policy became something they could depend on and questions that were asked and inconsistencies were kind of moved out of the way.

There was this dynamic taking place of group thinking – people began to figure things out. They allowed for spontaneously thinking strategies and there was a sense of confidence while issues were being figured out -- leading to new issues even today.

That group has done good work. They have received input from across campus. They have rattled a few cages. They have irritated a few people. But I have said to them continually, “When you serve on a committee you report to me. You come from your areas and you are on the committee because you have perspectives from those areas.

Complexity theory would contend that a healthy network environment allows for conflict to enter the organization. From this, agents from all levels of the organization would recognize conflict as a means to improve the business processing of the organization. The freedom to interact with colleagues internal and expertise external to the organization allows for multiple knowledge claims to be introduced for testing, resulting in higher participation and broader input in solution validation and leading to higher organizational accountability. With this strong environment, the process becomes seamless, consistent and highly participatory.

Power and Control – Proposition 3

In this study, we sought to recognize the application of power and control as a tool to enhance knowledge processing. Following the complexity model and the perception that new knowledge is generated through a social, participative process, the use of power has a different connotation for traditional autocratic, “top-down” leadership styles. Power in the knowledge-processing environment is focused on networks and less on heroic, individual authority.

Without question, every participant recognized the legitimate power assigned to the position they held. However, each accepted the fact that power allowed for decision making that enhanced the accomplishment of organizational tasks. The predominant pattern observed was the desire to establish a culture that enhances the collegial environment and supports organizational learning thorough the Knowledge Life Cycle framework. In this section, the concept of power and control within the knowledge-processing cycle is reviewed. The data identified issues concerning the perception of power and control, a consideration for legitimate use of power, and the recognition that power and control are leadership tools that enhance the knowledge-processing effort of the complexity organization.

Perception of Power and Control

Leaders in higher education carry tremendous power over resources and personnel. A review of financial documentation from the study institutions suggests that the economic impact of higher education is significant. The reality is that the president of a higher education institution functions as a chief executive officer of a business entity. Yet, in interviews, the legitimate use of control and power was rarely described as an important element in meeting organizational goals. An example of one president's concept of power follows:

I really never really think about it. I am not naïve. I realized that the president had tremendous power over a large number of employees. But, my focus is not power – my focus was how could I provide service leadership. I am only a displaced faculty member (for a very short period) in the role of president because my true calling is to be a teacher and once this assignment is completed, I plan to move back into that teaching role.

In fact, the concept of power made some uncomfortable:

Power is something that makes me uncomfortable – I never think about it. I am not here to be served and I have no expectations to be taken care of. But I do have expectations to service [in this institution].

My observation when coming here was it is dangerous for any one person to have that much power at an academic institution but that there needed to be input. We did not have enough input.

Legitimate Use of Power

Power in higher education is used to manage environments. The data indicated that control over systems was implemented with a clear goal of engaging the higher education community. If, in the perception of the senior leadership, the organization had become dysfunctional in some manner, direct intervention was required and acceptable. In several instances, the organization was broken and the leader was required to micromanage until knowledge processing was repaired and the organizational environment was capable of assuming authority over this process. One president stated:

We were a poor academic institution with a very poor reputation. Good decisions were not being made.

Another shared that the institution was in meltdown:

The institution really was in meltdown. In the business I am in we just call it the “downward spiral.” You get this spiral going that is taking the institution in the wrong direction. It gains momentum

like a hurricane and the faster it goes it draws and causes other issues and problems. And it overwhelmed the leadership team at that time. They had just run out of solutions. Some of the symptoms are that there were very few policies in place that deal with the routine kinds of issues. There was no policy manual, as such, and so those things that you just say, “well this is policy, this is how it’s handled,” there wasn’t anything to lean on. It was all done on one-on-one negotiations. In trying to go back in and see how things fit together there was no system.

Over a period of probably six to eight years poor or wrong decisions were made on a continuing basis. Some of them were just matters of policy. You know, an issue comes up and not having policy to fall back on, someone made a decision. Well, the same issue would come up again and the same exact kind of situation but not having policy. Another decision was made but inconsistent with the previous one. And in areas like personnel that is suicide.

Serious organizational issues require extraordinary measures. When an objective was not being met, the leadership response was to take immediate and direct intervention, especially in personnel issues. An organization in crisis demanded intervention, as described in these examples:

Power is necessary to achieve goals. If necessary, people may have to be removed in order to create the team to meet objectives.

We had to remove a number of people. We had to move people from the position where they really weren’t qualified into areas where they were qualified.

In addition, senior leadership indicated they had to break traditional methods of operation in order to establish new modes of management. Often this represented new leadership and the need to adjust historic patterns and culture.

So, I think we really did break the mold in the sense that any ad hoc committees had been put together by the leadership team and felt controlled by the leadership team. That was communicated to me fairly clearly by those who had served on other committees.

They just need to have time to come to grips with it is not the way it used to be. It is something different. You either help me, get on board, and we go together, or you may not be here. I have said that a couple of times to them. I have said, “Look, either you want to do this or you should let me know that you don’t want to be a part of this team.” I have had to say that twice, I think, in four years.

The leader would be asked to mediate issues and the application of power would evolve as the final resort. There was a sense of reluctance to rule over conflict, yet for the sake of the organization action was taken. For example:

Issues get a little bit complicated and you can't always get... you hear two different sides. You have got to make a judgment. Sometimes I have said, "I'm sorry but I just need you to do this." Sometimes I will say to people, "I know you think the only extension I am calling today is yours, but it seems like several things have been happening so I need for us to get together and let me figure out what we need to do to help." I think it is inevitable that you are going to have those little issues and battles and whatever, but I think you have got to pretty much get on top of those as quickly as you learn about them.

And so I have, over the years, said, "We just need to come together until we can figure this out. Now, if you all don't figure it out then I will and you won't like what I figure out. You will much happier if you figure it out together. Because, you know, my ideas might not be the right ones, but I am going to figure it out because we do have work to do." Most of the time we get it done. It may create some ill feelings but I try to be very sensitive to people and I want them to be sensitive to each other. I try to emphasize that.

The common patterns that emerged in this context are the application of power and control to solve immediate, short-term issues in order for the organization to move on in a positive direction.

Power as a Knowledge Processing Tool

The function of power and control in knowledge management is to remove the multifarious barriers that inhibit the Knowledge Life Cycle. Removing barriers requires the release of personal power for the benefit of networks that need the authority to manage the Knowledge Life Cycle process. Often this means understanding the brokenness of an organization before beginning the process of rebuilding. One respondent suggested that micromanagement is the default leadership style to set the proper foundation.

We had an organization that was struggling to make the right kinds of decisions that was being given little supervision and being led like they were a mature, well functioning organization. I had to change my style essentially to be a micromanager and so did my cabinet. And so, for the first probably four to five years we really micromanaged the institution because it needed maximum supervision as we took out people who were not able to do the job and replaced them with competent people that had to deal with the learning curve. Even though we got the right person in the job, their effectiveness didn't start the next day. It took us awhile to bring them into the culture that was changing. It is a long slow

turn; it's not like a speedboat. It took us four or five years to change the culture.

Ultimately, in this example, the culture did change and the organization was capable of creating a knowledge-processing cycle that was stable and effective. The foundation of the change was built on strengthened relationships and collaboration. Patience prevailed and the organization was stronger, as outlined in the conclusion of this statement:

One thing I would say we have accomplished in four years is we actually have a team because they are helping each other out, even though you still see the flashes of "Well, you have to understand what my problem is!" Now that I have had my say, let's get back to work.

One function of leadership was to use power and control to generate energy. This enabled creative thinking and strengthened collaboration and knowledge-processing networks.

From the senior administration perspective we try to exercise power as a form of creative energy. It is a very rare instance where we have to dictate behavior. To be sure, it happens whether it is in exercising power in the form of personnel decisions or policy decisions. It happens. That is where the vehicle for activity is power. We would much prefer that power be manifested as energy, as an enabling force rather than in the conventional sense of power being viewed as the expression of authority. We would rather see power in a more positive enabling force than the more traditional stereotype of it being a negative.

As discussed earlier on networks, the knowledge-processing environment is enhanced when a collegial, collaborative atmosphere exists. An important enabling function of power and control is to protect and maintain the knowledge-processing environment that reminds agents in the system that they are important to the learning process. One participant outlined this concept well:

We see them [internal and external stakeholders] as just a group, a partnership that we want to always be nurturing and maintaining. And when an opportunity comes for us, sometimes it is not always at the best time. So, I have the role of reminding people that if you miss an opportunity because you don't want to deal with it at a certain time then that opportunity may not ever come back. I guess in a sense one of the things that I try to do is to have to keep the balance with: I know we have got too much to do but I know we can do one more thing if we work together. I think that is part of just trying to make sure that we support each other and that we support other people.

This process of appreciation and affirmation in knowledge processing speaks clearly to maintaining a healthy environment.

I guess the thing I do is spend time trying to balance so that the left hand appreciates what the right hand is doing and where the right hand appreciates what the left hand is doing. I try to encourage in every situation the unit managers to talk to each other.

The data spoke clearly that power is a leadership tool that should be used to enhance the knowledge-processing capacity of the organization. The leader must be able to utilize indicator tools, as discussed earlier in this chapter, to understand when a knowledge gap exists and when the need for new knowledge arises. Repeating indicators reveal an inability of the organization to address knowledge gaps. This is important for the leader to recognize, as the barriers that exist may not be evident. Thus, an investigation and rectification may be necessary.

Ultimately, the product must be delivered to the customer. Regardless of the processing of knowledge gaps, a role of leadership is to ensure that organizational objectives are met. Knowledge processing will not sacrifice production over process; in fact, quite the opposite is true. With superior decision making in a collaborative process, the quality of decisions and the commitment to those decisions are stronger. As McElroy (private conversation, 2003) stated:

That does not mean that the decisions reached by managers who hold exclusive control over business processing couldn't be preceded by widespread organizational debate over competing knowledge claims or that that debate couldn't continue both during and after managers have made decisions. So, what we are trying to do here is to try and formulate an approach that makes it possible for knowledge processing to be everything that it can be from an enterprise wide distributed bottom up social process without undermining at all the power and control held by managers over business processing.

Vision – Proposition 4

Vision is purported to be a knowledge claim. A knowledge claim, as defined by KMCI and applied to the Knowledge Life Cycle, is:

A codified expression of potential knowledge which may be held as validated knowledge at an individual and/or group level, but which has not yet been subjected to a validation process at an organizational level. Knowledge claims are components of hierarchical networks of rules, that if validated would become the basis for organizational or agent behavior.

The creation of a knowledge claim is an individual or group process and the validation of claims is subject to an organizational process that involves individuals throughout the organization. This appears to conflict with the view that it is traditional leadership's responsibility to control the vision of the organization (Fayol, 1949). Creating vision is often portrayed as a unique role of leadership and a defining

characteristic of leader success. Bennis (1989) stated “the single defining quality of leaders is their ability to create and realize a vision. (p. 194.)” Discussion with study participants led to the question on leadership: Is vision created through a knowledge-processing system that engages the organization or is it entirely within the purview of the leader? The investigation focused on the creation of vision and studied the apparent dichotomy of these leadership roles.

McElroy (2003c) stated that organizational visions are important but shared visions are better. In order for vision to be shared, it must be collectively produced. It is important to have these ideas subjected to the proper level of testing and evaluation. The validation process, theoretically, would produce fewer errors in the vision of the organization. Also, a collectively produced vision would suggest greater involvement and support.

The purpose of the vision is to define and stretch the institution. Vision must tie the institution together in a single direction and must have a role with all stakeholders. When asked to define vision, participants stated the following:

Vision should dictate and represent the tradition of the institution and change. It should be simple and clear. It should have meaning -- not only on campus and with stakeholders on campus but with external stakeholders as well. A good vision would call attention to the institution as well as a broader picture of what that institution represented.

A different participant expanded upon this notion that the vision must stretch the institution.

A vision captures the imagination of the institution in terms of what it can become as opposed to simply what it is and what it has been. To me, one of the primary purposes of leadership is to stretch an organization’s notion of its potential, and potential is necessarily expressed in vision.

One participant claimed that establishment of organizational vision was new to higher education. To claim a vision was to introduce a new level of accountability:

Vision at the universities in higher education got a late start – it was a process that primarily came through corporate America. Partially that late start was because leadership in higher education – specifically presidents – did not want to be held accountable.

The data reported a mix of responses to the leadership role in defining the vision of the organization. Several participants indicated that organizational vision is established by seeking participation from all levels of the organization. A leader role is not to create an independent vision, but to assist individuals in the organization to connect with the collective vision. In addition, the leader’s role is to keep the organization focused on the established vision.

Organization vision, ideally, should not be solely the responsibility of or the prisoner of a president or CEO. In the context of

organizational visioning, ideally it seems to me, the president or CEO is much like an optometrist. That person is enabling an organization to see more clearly its visionary potential. Often organizations over time become... their vision is blurred. It becomes foggy by the routine of inertia. And, a new executive often can play the catalytic role of enabling that stale vision to be freshened by either renewing a formal opportunity for envisioning, enabling people to think concretely about vision again rather than just keeping their heads down and doing their daily routine, and just presuming that there is no opportunity for that.

One participant stated that the leader needed to have the ability to interpret vision as a stretch point for the organization. This is a special skill of leadership.

There is an aggregate vision that begins to unfold that presidents pay attention to. But then there is another dimension that comes out of the... I don't even know where it comes from... the subconscious of the president, let's say, to say, "This is where we are and this is where we need to go." Here is the stretch point for the institution. Based on all of that, here is where we need to be moving in the next 10 years.

Another participant viewed vision as shared, yet recognized that seeking collective agreement is not practical.

In a large organization, I have never known there to be a vision emerge that represents unanimity. What one hopes occurs is that through formal and informal vehicles for visioning, an organization forges a consensus about its vision that is animating rather than simply reinforcing.

Yet, once the vision is set, there is an obligation for all members of the organization to accept the direction (jointly developed or mandated) of the organization.

I think that if you have a vision it is not just enough for them to know what the vision is, they have to believe in it. Otherwise, they need to get off the bus.

The data clearly indicated that the leader shoulders a great responsibility to communicate the vision "so that there was no sense that [the President] owned a part of this university and the rest of us do not." One participant stated, "We all own it together and therefore we all own the vision together. You know, I think we are lucky that we have a very simple vision."

The creation of vision is a process that anchors the strategic foundation of the organization. All levels of the organization must be connected to the vision and feel invited to identify gaps. One participant stated:

The vision is created through processes. For example, strategic planning necessarily begins with a reiteration of the vision. That

reiteration can be solely, at times, a reaffirmation. But more often it is a reiteration that is that includes some modification as changing conditions warrant. Those changing conditions are not just external but they are also internal and often they come in the form of new leadership.

The data indicated that a leader role includes establishing an environment for the organization to collectively develop and set the organizational vision. The establishment of vision appears to be a leader role, while the act of creating the vision is an organizational process.

Discussion

This study provides enhanced understanding of knowledge management and, thereby, sought to contribute to the study of organizational learning. The Knowledge Life Cycle (KLC) offers a useful framework to understand the dynamics taking place in organizational learning. By identifying indicators of knowledge gaps and understanding the environmental needs for seamless interaction between business processing, knowledge production, and knowledge integration, higher education leaders can enable the KLC environment. Also, by understanding the dynamics of organizational and personal resistance, leadership strategies can be established to minimize interference in the KLC. Through this study, organizational learning concepts in higher education are identified that may be applicable for other organizational settings.

Respondents that were introduced to the KLC confirmed that knowledge gaps do exist in the higher education business-processing environment and that the organization needs a systematic process to resolve them. The cyclical process proposed by the KLC, suggesting a seamless and continuous interactive process, was supported. Further, the need to create knowledge and the need to integrate newly created knowledge into business processing are recognized as the two primary processes in the organizational learning cycle. From this study, we propose that leader influence over the KLC environment can significantly enable or inhibit this process. The term, “we” refers to the authors of this study.

Proposition 1 states that effective interaction between business processing and knowledge production is constant, seamless, and barrier free. The data support this proposition, and we concluded that leadership behavior could enable the interaction between business processing and knowledge production in the KLC (Figure 5.1).

The data supported the existence of a relationship between business processing (expressions of organized knowledge) and knowledge production and integration. As demonstrated in the KLC framework (Figure 5.1), once solutions are identified (knowledge claim formulation) and validated (knowledge validation process), a process of knowledge codification (knowledge diffusion) follows. Data support knowledge processing as a self-organizing, social process patterned after complexity theory. Power and control are distributed in an effective environment to networks as proposed in proposition 2 and proposition 3. The nexus between these processes is seamless and ongoing when leadership maintains an effective environment.

Leadership Roles in Knowledge Management

Leadership clearly has a role in enabling the knowledge-processing environment. Examination of the data revealed a thorough list of leadership roles that impact the knowledge-processing environment. By understanding roles that were defined by respondents, we can establish behaviors that enhance the knowledge-processing environment. As respondents reflected on the KLC, they identified a new leadership skill that was not anticipated by our theoretical framework; effective knowledge leaders must be able to identify knowledge gaps within their organization. Picking up on KLC “indicators” is an essential element in being able to enhance this process. The data

suggest the following roles as they pertain to the KLC and knowledge-processing environment (Table 5.1):

Table 5.1. Leadership Roles in Higher Education Knowledge Processing

Mission Leader	The role of mission leader is important to senior executives in higher education, not only to protect the core mission, but also to establish a knowledge-processing environment to meet changing internal and external conditions. The leader must grasp the mission of the institution and establish clear expectations so that the institution does not “lose its way” in knowledge processing.
Environment Changer	A leader’s role is to break negative organizational behavior and to establish new methods of organizational problem solving. Before the mission can be met, the negative environment has to be transformed into one that enables knowledge processing. An essential leadership role is modeling this openness for other people in the organization.
Future Leader Preparation	The leader role is to model the environment through careful selection of key team members and to establish quality mentorship programs to prepare future leaders. Future leaders must be trained to be especially sensitive to knowledge-processing behavior.
Collaboration Leader	A key management principle in higher education is the need to collaborate with all stakeholders to establish a healthy knowledge-processing environment.
Community Leader	Leadership must maintain strong community relationships critical to defining the institution.
Crisis Manager	Crisis can lead to an environment of learning. Patterns that emerged in this context are the application of power and control to solve immediate, short-term issues in order for the organization to move in a positive direction. Regardless of the processing of knowledge gaps, a role of leadership is to ensure that organizational objectives are met. The leader must be one who challenges the status quo in all levels of the operation.
Knowledge Gap Identifier	The ability to identify knowledge gaps is a critical leadership skill. Once a gap is identified, the leader analyzes the components of the knowledge gap to determine potential threats to the organization as well as strategies to resolve the gap. The leader must first grasp the impact of the gap upon

	organizational mission. If the gap requires external expertise, the leadership role is to seek appropriate resources.
Barrier Remover	A variety of barriers “inhibit” the seamless transitions shown in the Knowledge Life Cycle, and the role of leadership is to identify and remove barriers to enhance this cycle. Leadership must acknowledge the need for an environment in the organization that enables barrier free knowledge processing. Repeating indicators reveal an inability of the organization to resolve knowledge gaps. This is important for the leader to recognize, as the barriers that exist may not be evident. Thus, an investigation and rectification may be necessary.
Personnel Manager and Cheerleader	Identifying and placing key personnel in appropriate roles is a high priority. The team leader is to encourage everyone to think of gaps as an opportunity and to remind people that the mission is to work with partners. Every person must understand their role and how they fit into the bigger picture. This premise leads to the consideration that all levels of the organization participate in developing and testing solutions.
Policy Manager	Clear policy gives the entire organization guidance in the knowledge-processing cycle, clarifying roles and empowering individual action. Policy gives employees direction and confidence in participating in the business processing of the organization. The leader role is to balance policy matters and reduce historic bureaucracy in order to encourage consistency and openness. Also, leadership controls the process of committing the organization to action. If this “power” to commit the organization is strictly controlled, the knowledge-processing environment is negatively impacted.
Network Manager	Without the opportunity to examine knowledge gaps and establish networks to test and validate solutions, knowledge processing will break down. A leader role is to support the creation and application of networks to examine knowledge gaps and, secondly, to identify and remove barriers to network development. The strength of organizational networks is much larger than individual relationships; it is a collusion of multiple roles and expertise bound together to strengthen the organization. This enables creative thinking and strengthens collaboration and knowledge-processing networks.
Vision Manager	Vision must tie the institution together in a single direction

	and must have an impact on all stakeholders. The organizational vision is established by seeking participation from all levels of the organization. A leader role is not to create an independent vision, but to assist individuals in the organization to help develop and identify with the collective vision. The leader's role is to keep the organization focused on the established vision.
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New Leadership Skill

This study is grounded in the concept that leadership has a critical role in establishing and managing the knowledge-processing environment. As knowledge management and the establishment of a knowledge-processing environment is a new science, we suggest that a new leadership skill has emerged in this study. This new skill is labeled “knowledge gap identifier” and is specifically defined in Table 5.1. The leader must know the organization and respective indicators that suggest a knowledge gap exists. Examples in the data include circular, undirected conversation, leadership intuition that the organization was stagnant, confusion in the faces of employees and a general loss of energy. One respondent stated:

A better way of defining it would be certainly a decline in energy. Whatever BTU's you are operating under, you sense that that heat has gone down and that it must be a gap in the knowledge base that you have about a particular matter or particular issue.

Knowing a gap exists gives the leader insight into the pulse of the organization. Once recognized, the nature of the gap can be introduced to the KLC. Perhaps the formation of knowledge claims calls for external expertise or additional resources. In effect, with early recognition, the organization does not waste resources attempting to manage unresolved gaps. A skilled leader can assist the KLC environment by serving as a gatekeeper in the transition from business processing to knowledge processing and enabling the seamless environment as suggested in proposition 1.

Business Processing – What Is Going On

The role of leadership extends beyond enhancing an environment to resolve knowledge gaps as suggested in the KLC. Once respondents fully understood the dynamics occurring within the KLC, they suggested that a deeper study of the business-processing environment might be warranted. The business-processing environment exists for daily management activities in order to maintain and manage the organization. Beyond identifying and resolving knowledge gaps, an important leadership role is to consistently challenge the organization to engage in continuous internal evaluation. The leader must also cast a critical eye on existing policy and programs to seek new and better methods to achieve organizational objectives before the level of “knowledge gap” is reached. Ironically, in an ideal setting, the leader not only responds to knowledge gaps, the leader creates them. There is a constant internal assessment to establish “creative

abrasion” (Leonard & Straus, 1998) within business processing. This essential leadership role deserves deeper consideration as it redefines the role of leadership within knowledge-management activities.

Additional considerations on business processing emerged from the study. Respondents suggested that multiple levels of KLCs occur simultaneously within the organization. Multiple level KLC activity requires a basic level of established and accepted structure representative of the role and mission of the organization. This is not to suggest that this structure would be set in stone, rather it would be open to continued testing and adaptation representative of the KLC. If knowledge processing is occurring at multiple levels of the organization, then common guiding principles, programs, and vision must exist to move the organization in a common direction. The reality is that there are overriding rules that bind the organization together. These include the mission and vision, rules of ethical behavior, and financial accountability, to name a few.

The additional benefit of accepted structure is that there is a sense of order and a distribution of authority. The leader has achieved a level of autonomy and confidence in the organization to manage and resolve knowledge gaps at multiple levels. One respondent supported this concept well:

What I want to see happen is that we all are on the same page in terms of our strategic goals, our cultural values, and our operational styles...and they can be allowed to operate within their division or their area of responsibility with virtual autonomy. And that I don't have to be concerned about what they are doing, how they are doing it on a daily basis, but rather can serve as a supplement to their work rather than an authority over their work.

Crisis Management

An organizational crisis can both benefit and inhibit the knowledge-processing environment. The data suggest that organizational crisis can serve as a precursor to team development and unity. Crisis periods can clarify and delineate secondary issues from primary priorities and direct the energy of the team. However, crisis conditions are detrimental to knowledge processing because they decrease time and resources needed by the KLC. While crisis does appear to offer initial benefits, it does not enhance organizational learning on a long-term basis. Once the crisis is averted, old programs and policies return. The end result may be a resolved crisis, but the organization has not removed the knowledge gap that may have initiated the crisis in the first place. Ultimately, a crisis environment does not strengthen the knowledge-processing environment.

Power and Control

In this study, we proposed that power and control are embedded in network dynamics rather than in leaders in the knowledge-processing environment. The intent of the investigation was to determine the use of power to achieve organizational goals. Clearly, the participants of this study suggested that power is not utilized for personal

gain or to enhance one's reputation. Also, power and control are not used to limit input or to deteriorate relationships. Power and control, through legitimate means, are applied to remove barriers, establishing seamless transitions inherent to the KLC. Once barriers are removed, the leader releases power and control to the knowledge-producing dynamic, especially social networks that emerge to engage in the resolution of knowledge gaps.

The discussion of power and control centers on institutional effectiveness. If, as this study suggested, the function of power is to remove barriers to enhance network development and the self-organizing process, what does this mean for traditional autocratic strategies and heroic leadership? Simply, in a collaborative knowledge-processing environment, the role of leadership is one of managing the knowledge-producing environment. The control aspect may be in developing accountability systems. Ultimately, the product must be delivered or service rendered. Knowledge management does not constrict productivity; it enhances it. This study validates that in an effective knowledge-producing environment, power is distributed throughout networks to enhance multiple-level KLC activity. For multiple-level KLC activity to meet organizational objectives, suitable accountability and assessment systems should be established.

A longitudinal study of multiple organizations within an organizational setting would validate the claim that multiple Knowledge Life Cycles exist within the organization. The researcher's position is that there is a connection between distribution of authority within the organization and the health of knowledge processing within the organization. As power and control are distributed from senior leadership to interdisciplinary networks, the increase of complexity behavior, the openness of the organization, the social growth of networks, and the level of knowledge processing are enhanced proportionally. The distribution of authority to commit the organization to action is a key variable in a future longitudinal study.

Inhibiting Knowledge-Processing Environment – Organizational Issues

Resistance to change will always be an issue that inhibits knowledge processing. Additionally, the data suggested that knowledge-processing environments are negatively impacted such problems as broken operational systems, uncertainty about resources, limited and unclear policies, poor communication, hiding behind technology, poorly placed personnel and overdependence on current success. The role of leadership is to understand these potential inhibitors and to seek methods to keep them from becoming barriers in the knowledge-processing environment.

In this study, the goal was to identify and verify the existence of inhibitor behavior in the effective knowledge-processing environment. These behaviors exist and leadership must establish programs and policies to reduce impact on the knowledge-processing environment. For example, the data suggested that before an environment enabling knowledge processing can be put in place, a base level of operation must be sustained. While not ideal, autocratic control was reported as a necessary means to establish the baseline knowledge-processing environment. A worthwhile study could focus on identifying when autocratic control is appropriate to establish this baseline, especially when the system is considered "broken" and an immediate intervention is necessary to protect the mission and integrity of the organization.

In higher education, public organizations depend upon state funding. In recent years, this funding has been inconsistent and depleting. According to respondents, inconsistent state support has led to confusion and frustration, leaving the organization incapable of functioning properly. We would argue that a difficult funding philosophy is a knowledge gap. The function of knowledge processing would be to seek solutions to the funding crisis by utilizing social networks for new knowledge claims, testing and validating claims, and integrating these into the organization.

The data demonstrated that new technology could become a mechanism to hide behind, leaving the organization stifled. With the emergence of communication tools, like e-mail, the value of open, personal communication could be negatively impacted. Leadership sets the conditions for communication to support the open and inclusive environment called for in the KLC. The use of new technology can be a tremendous asset to enabling knowledge processing. Like all new assets, the proper application is essential to enhance the ability of the organization to meet objectives.

Personnel resistance to change was the most discussed inhibitor to knowledge processing. This includes active and passive resisters who prefer previous methods of operation and who do not welcome a new paradigm. Often resistance comes as a result of a period of adjustment to new leadership. Also, a perception exists that participating in networks dedicated to seeking solutions is an added responsibility. There is ample opportunity for leadership to educate personnel on the personal and organizational benefits of participating in knowledge processing. Many entry level employees, holders of vast tacit knowledge, have never been asked to participate in a KLC process. This requires time for transition and confidence building and a redefinition of organizational culture.

Finally, one indicator of resistance came from a surprising source – success. It is possible for organizations to feel as though there is no need for examination or to engage in knowledge processing. The leader role is to challenge this type of comfort. If too comfortable, the organization loses its edge, and organizational goals are not met. A vision that stretches the organization creates knowledge gaps. This would enhance the KLC in stagnant organizations.

Environmental Conditions to Enhance Knowledge Processing

A potential area of study is based upon the premise that leadership manages the policies and programs that enable the knowledge-processing environment. This current investigation leads to the belief that measurable dimensions of a healthy environment can be established. McElroy (2003) introduces prospective dimensions in his work and suggests that leadership's influence on these dimensions directly enables or inhibits knowledge-processing interactions. In this study, we confirm his hypothesis and suggest additional work in this area. However, we propose that an analysis of environmental dimensions can lead to a quantitative instrument that, through study and validation, would identify the ideal knowledge-processing environment. Further understanding of the leader-enhanced learning environment has tremendous potential for establishing guiding principles for all types of organizational settings.

High KLC confidence leads to high KLC activity. We argue that there may be common environmental dimensions that can establish a baseline instrument that is applicable far beyond the higher education setting. From this information, leadership can retool the environment to enable the ability for knowledge processing to occur, thus leading to the benefits that knowledge processing espouses.

The leader has authority and responsibility for the knowledge-processing environment in the organization. The environment must be transparent, and healthy networks must exist for a bottom-up management style to work. The key concepts of the environment are consistent with Firestone and McElroy's work defining and outlining the "Open Enterprise" (Firestone & McElroy, 2003). Thus, we conclude that an instrument can be developed to measure perceptions of openness and strength in the knowledge-producing environment.

Networks

The literature discussion demonstrated that knowledge processing is a social process; thus, social networks are essential to learning. A primary leader role is to support the creation and application of networks to examine knowledge gaps. In addition, effective leadership identifies and breaks down obstacles to maintaining healthy network interaction. Networks and self-organizing behavior need time to develop.

Networks are the engines that make knowledge processing work. Networks are made up of a group of individuals who share common goals and diverse backgrounds dedicated to the resolution of a knowledge gap. Agents in the process need different backgrounds, training, and experiences in order to establish a well-rounded perspective in approaching knowledge gaps. The collaborative nature of healthy networks allows for a free interchange of ideas. Respondents suggested that the strength of organizational networks is much larger than individual relationships; it is a collusion of multiple roles and expertise bound together in a manner that strengthens the organization.

Leaders must open the learning process to make it transparent and inclusive, especially for the participation of "tacit" knowledge holders. Trust and openness are essential. Gaps are not feared or seen as deterrents to success. In a healthy network environment, conflict is welcomed. Agents from all levels of the organization would recognize this conflict as a means to improve the business processing of the organization.

Vision

We have argued that organizational vision is a KLC knowledge claim. As such, following the KLC framework, vision must be collectively produced, tested and validated. Further, we have argued that a commonly acknowledged vision serves as a foundation for the organization in KLC activity. Vision, along with policies, programs and history, establishes guiding principles and direction for the organization. Granted, these policies and procedures are continuously subject to validation and testing, but they exist to give the organization a foundation for the KLC to work.

The data offer a mix of interpretation of the leader's role in the establishment of organizational vision. There seems to be a disconnection between the perceived responsibilities to create the vision and the process utilized in the testing, validation and codification of the vision. To external stakeholders, a distinctive role of the senior executive, and a sign of strong leadership, is to bring a vision to the organization. The higher education leaders who participated in the study acknowledged this perception; however, in the process of establishing the vision, the study participants confirmed using the principles of the KLC. On the surface, this seems to create a conflict. The senior leader needs to appear strong and vital in this process, but in reality these leaders depended heavily upon external and internal stakeholders for the creation and validation of the vision.

In this study, we conclude that vision creation is a KLC process. The data suggest that the vision knowledge claim is distributed through the organization and is open to network evaluation. The need for heroic, visionary leadership is a misperception. The effective higher education leader builds vision through the organization in a KLC process. Perhaps the role of the leader is to introduce the initial knowledge claim, fulfilling the perception that is desired by external stakeholders.

Higher Education Is a Changing Organization

The ontological portion of the study identified current issues in higher education as a knowledge-producing organization. Common patterns and themes of leadership behaviors were sought from which knowledge-processing patterns emerged. Every respondent initiated organizational learning by defining higher education as an organization in transition.

It is clear that internal and external pressures are forcing change. The perceptions and expectations of stakeholders and decreasing levels of public and private support and higher accountability are several key issues that were highlighted. The pressures on the study setting allowed for the researcher to identify specific knowledge gaps that each respondent could apply to the KLC. To reiterate comments made in Chapter IV, one participant stated, "This is a very, very difficult time to lead in higher education. You have specific goals that are set. You have a specific plan. You have a road map. You have an academic plan."

A second ontological concept is that respondents viewed higher education as a learning organization. According to one respondent, learning is accomplished by creating a culture across the campus through the behavior of the president, the senior staff, and the organization itself. Leadership must model learning, curiosity and innovation, and, in this environment, faculty and staff realize that they are not going to be reprimanded for suggesting something new. Rather, they are going to be encouraged, rewarded, and applauded for suggesting ways of doing things differently and better.

Respondents are concerned for future leadership in higher education. One important ingredient in the leadership agenda is to seek out emerging leaders and prepare them for future challenges. This need was especially relevant given the high turnover of senior leadership. As was stated:

The average life span of a college president is 4.8 years. That's how long it takes to fix the easy problems. However, a friend of mine is doing research and to "transform" the university – to be a transformational leader – the average life span of the president has to be 13 years to ensure effective change.

The increased pressure on leadership suggests that leading in this environment is becoming more difficult. Training future higher education leaders to manage complex organizations is a high priority.

In this study, leadership suggested that community relationships are essential. Higher education is not an island. External stakeholders, especially community interests, have a place in assisting in the definition of higher education. There is a place for community leaders and external stakeholders to support knowledge processing in higher education. Discussion should continue on how these stakeholders can be utilized in the best manner.

Determining Success

Any framework representing organizational learning is useless if limited means exist to measure success. How do leaders claim that their organization has learned if there is no viable method to determine success? Quality assessment is the answer. As one respondent stated:

Assessment is critical. You can have an instinctive perspective and instinctive reaction that says "this is good" or "this is bad" or "will be good or bad." The only way you really know is to measure it and to go through a complete assessment process. I think that is when you can tell that somehow when the subject comes up again that there is a higher level of understanding. The assessment process either confirms or denies what your instincts were about it in the first place.

In higher education, standards are established by accreditation agencies. In each of these specific study settings, the institution was under the oversight of standards established by the Southern Association of Colleges and Schools (SACS). Simply, the accreditation agencies establish clear standards to define a successful organization in higher education. The individual institutions adapt to the standards and measure success rates as they are relevant.

In the ontological portion of this study, the data suggest that stakeholders sought high levels of accountability for higher education. Some stakeholders suggest that higher education should be "run like a business," a notion that is resisted by respondents. However, accountability in higher education is important and as one respondent stated, "It is becoming the norm, but not the answer, to all the challenges to higher education."

Assessment and accountability are a reality in higher education. Standards are set by the academy that defines quality in higher education. Common standards reduce external influence and offer leadership guidelines to manage organizations. Accreditation

standards are continuously subject to testing and validation following the KLC framework.

However, while assessment has value, higher education leaders must keep this process in the proper perspective. In higher education, many services and products are difficult to assess in quantitative measures, and, as a result, measuring organizational success in higher education continues to be a challenge. The answer lies in the leader's ability to maintain an effective environment allowing for continuous KLC activity. Thus, the organization continues to self-evaluate and seek methods for improvement.

Conclusion

The purpose of this study was to test and evaluate the KLC in higher education organizations and to verify the application of networks as a mechanism to enhance this process. We conclude that the Knowledge Life Cycle is a useful framework for increasing and codifying knowledge in higher education. A skillful leader will recognize indicators to knowledge gaps and will enhance the transition from business processing to knowledge processing. This transition should be seamless, and it is enhanced through an open and transparent organization. As the organizational culture recognizes that leadership welcomes a knowledge-processing environment, tacit knowledge holders will become more involved in the identification and validation of knowledge claims. Nonaka and Takeuchi (1995) state that learning is accomplished when tacit knowledge is transformed into explicit knowledge. Thus, we conclude that leadership has a critical role in establishing an environment which enables this process. Barriers to network establishment should be removed and power for multiple levels of KLCs to commit the organization into action should be carefully distributed.

Clearly, there must be structure in the organization for KLC activity at multiple levels in the organization to succeed. Resistance to knowledge processing does exist, but this is usually due to employee lack of confidence, poor structure, or unequal distribution of power within the organization. Leadership controls these issues and can enhance the KLC to remove resistance barriers. In this study, we saw limited resistance from respondents to participating in organizational learning activities. In fact, a major leadership challenge is making higher education more inclusive and welcoming to traditional, external stakeholders.

There is ample research opportunity in identifying and validating the essential dimensions of the KLC environment. We suggest two specific concepts. There are dynamics within the business-processing environment that deserve further investigation. The role of leadership expands beyond seeking solutions to knowledge gaps. The data suggest effective leadership continuously challenges the business-processing environment and creates knowledge gaps as a tool of constantly fine tuning the organization. Basically, the role of the leader is to ask "why?" By doing so, impending knowledge gaps are identified and resolved before crisis environments emerge. The ongoing fine tuning of the business-processing environment can reduce what respondents referred to as "broken systems." This concept deserves intense study at the micro level of the organization.

Also, we concur that an effective KLC environment has consistent dimensions as defined by McElroy (2003b). We believe an instrument can be developed that is

applicable across multiple organizations and multiple levels within organizations, serving as a tool for managers to assess the health of the knowledge-processing environment. These data points could serve as training portals to enhance this environment.

Regardless of the theoretic framework offered to demonstrate organizational learning, the role of the leader is to create an environment that is welcoming and enabling. The function of leadership is to enhance the ability of the organization to meet objectives. Even with tremendous funding pressures, increased expectations from internal and external stakeholders, and a culture which promotes critical and free interaction, higher education can establish effective Knowledge Life Cycles that enable organizational learning. It is these pressures that lead to knowledge gaps. These gaps, properly evaluated and codified, will strengthen higher education.

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