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How Hospital Environmental Managers Learn Compliance: A Learning Process Model

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HOW HOSPITAL ENVIRONMENTAL MANAGERS LEARN COMPLIANCE:
A LEARNING PROCESS MODEL

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HOW HOSPITAL ENVIRONMENTAL MANAGERS LEARN COMPLIANCE:
A LEARNING PROCESS MODEL

By

Victoria Anne Jas

A dissertation submitted in partial fulfillment

of the requirements for the degree of

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ABSTRACT

Recent national media coverage of hospital mismanagement of hazardous materials and waste has brought the practices of all hospitals into public scrutiny. Many people are amazed to learn that there is no national training or accreditation program for environmental management in hospitals. Hospitals are held to the same standards for hazardous materials management as are corporations in the industrial sector. Rural hospitals are particularly challenged because they have few resources. Overall, small hospitals need much improvement, but there are also examples of where individuals have done exemplary innovative work in improving environmental management.

In this study I investigated the challenge rural hospitals face to improving environmental management practices by inquiring into how environmental managers in small rural hospitals in New Hampshire learned to do their job and maintain their skills. I used the constant comparison coding method from grounded theory to generate key categories and concepts that could explain the personal and systematic challenges these individuals face. Using these concepts, I developed a learning process model that demonstrates how the managers initially learned how to do their work and how they went to on to maintain their skills. In cases where individuals excelled and developed innovative practices in their organizations, I inquired into the factors that contributed to their success.

The purpose of the project was to document systematic challenges and obstacles that the managers need to overcome in their work. These can be used to promote recommendations that would enhance the environmental management practices of rural hospitals nationwide. One key obstacle is that hospital management emphasizes income generation over expense shedding and environmental managers have no billing capacity.

Consequently, even though improved practices can save costs, the capital needed for these changes is difficult for the managers to secure. Another key obstacle is the regulatory climate of fear under which managers work. The EPA regularly issues threats and warnings without providing managers with the assistance and advice they need to do their jobs well. These and other findings point out the need for training and assistance programs that will help managers do their jobs better.

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CHAPTER ONE: INTRODUCTION

Problem Statement

Hospitals are large and overlooked sources of hazardous materials and waste. Hazardous materials such as pharmaceuticals exist in hospitals in small quantities, and there is an abundance of other hazardous materials such as fuel oil and oxygen. In New England and New York, lack of a program to manage hazardous materials is the most frequently cited hospital violation (Bowen, 2007b).

Hospital personnel need to know how to handle hazardous materials and waste responsibly to protect public and environmental health. This is especially an issue in smaller hospitals that do not have the funding to staff environmental managers. Even larger hospitals and the organizations that determine compliance, such as the Environmental Protection Agency (EPA), do not always agree on the responsibilities and requisite competencies for environmental management. The job description itself has not developed and lacks the legitimacy and authority of a professional career with the organizational status of continuing education and networking, common in other non-clinical healthcare professions. The environmental manager's ability to effect change has a direct impact on a hospital's hazardous materials management.

This dissertation seeks to reveal the process of learning that environmental managers use to acquire the skills that they need to successfully manage their environmental programs.

Research Questions

Successful compliance with federal environmental regulations and the nurturing of innovative environmental practices begins or ends with environmental managers, and it is not known how they learn how to do the job. Their abilities to comply with federal environmental regulations, such as the Resource Recovery Conservation Act (RCRA), or to nurture best

environmental management practices without learning from their experience cannot be evaluated. My research questions focused on three aspects of the environmental managers' experience: training; education; and supervision. The first aspect was that there was limited evidence from EPA inspections that some hospitals entirely lacked a program to manage hazardous materials. It was not that the program was poor, but that it was non-existent. The absence of compliance and/or ignorance of a 30 year old environmental regulation (in this case, the Resource Conservation and Recovery Act, or RCRA, enacted in 1976) led me to ask how hospitals would learn that this is a requirement in the first place, who is charged with an awareness of external requirements, and how they prioritize and make resources available to meet this obligation ("Hazardous Waste Regulations," 2009). How does such an obligation develop into a staffed responsibility? In many smaller hospitals, no job description exists for the management of hazardous materials and wastes. Many hospitals have a person in charge by default, but without a budget or formal training. I wondered how these persons originally learned the job, especially given that almost of all them did not follow another person into the position in their hospital.

In New Hampshire, 13 of the 26 acute care hospitals have fewer than 50 beds. These facilities have no professionally trained person to manage large volumes of chemical, biological, or radiological hazardous materials and waste. Despite their size, small hospitals offer most of the same services as larger hospitals, and in turn generate similar waste streams as their larger counterparts. For example, small hospitals generate pharmaceutical, chemotherapy and medical wastes. The only significant difference between small and large hospitals is the quantity of each waste stream.

Unlike their larger counterparts, small hospitals do not have the staffing or expertise to handle these waste streams. By default, inexperienced personnel are assigned responsibility for the

waste. These individuals often have few or no resources available and have not been educated on proper waste and hazardous material disposal compliance. In large hospitals, compliance responsibility is usually assigned to the hospital's Environmental Manager. For small hospitals, *Environmental Manager* is a somewhat misleading term, because in many small hospitals, and in all of the hospitals in the study, none of the people who were charged with the responsibility of managing hazardous materials or waste held this title or held sole responsibility for the task. Hazardous materials and waste management is a responsibility typically borne by managers of Housekeeping, Environmental Services, or Facilities departments. This became the first research question:

1. How did the environmental managers originally learn to do their job, how did they maintain their skills through job training or formal education, and how were they supervised and evaluated?

The second aspect that led to my three research questions was based on my previous experience of working with small rural hospitals as I provided community benefit services. I was constantly asked for assistance with the operational work of attaining and maintaining compliance. While the RCRA requirements may be 30 years old, they were originally written for the manufacturing sector, and can be challenging to apply to service industries. In addition, state and other federal regulations are constantly being changed: as in other industries, environmental compliance is a moving target. This helped determine the second question.

The Region I (New England states) and II (New York and New Jersey) offices of the EPA held a conference on hospital environmental regulatory compliance within their jurisdictions in January 2007. Out of the 480 hospitals in Region II, forty-nine had been inspected under the two-year compliance focus program. Thirty-six hospitals had regulatory actions taken

against them, with eleven of those involving penalties that averaged \$142,000 per hospital.

Seventy percent of the violations were found under RCRA regulations. Of these violations, the top ten addressed identification of hazardous waste, universal waste management, container management, labeling, manifest management, and training. Inspectors reported that the primary barrier to compliance appeared to be inadequate resources for people, equipment, and training (Bowen, 2007a). They also noted that line authority was often absent in hospital hazardous materials or waste management programs. This became the second question.

2. How do hospital environmental managers learn to navigate through challenges of complying with regulations; achieve compliance and make efforts to introduce best practice?

The third aspect of my work that helped me to develop my research questions was based on what I observed other industries accomplishing. Colleges and other institutions - sectors that were similar to healthcare - had already developed environmental compliance programs. These sectors had moved beyond meeting the baseline of regulated behaviors. They had developed systematic means of assessing their progress, tying their environmental work to the vision and mission of their organizations. They had learned to communicate this and embed an environmental ethic into their organization. Could the same thing happen in small hospitals? What was happening in small rural hospitals? Was it possible to replicate this learning process? Hence the last research question.

Like other learning organizations, constant change interfaces with technology and people in hospitals as well. Some of the largest hospital systems, such as Kaiser Permanente in California, are leading the country in promoting innovative practices ("Kaiser Permanente Wins National Green Awards," 2008). These include the redesign of work practices to replace hazardous materials with non-hazardous ones, eliminating the need to comply with RCRA regulations and

increasing workplace safety and environmental protection. Anyone who introduces and champions innovation must have a level of technical mastery and astute organizational navigation skills to see success in projects ranging from a small-scale recycling program to a full-system change. Asking managers if this type of approach to work was on their radar screens added to an understanding of how innovative environmental practices are learned, disseminated, and nurtured in a small hospital. This became my third question.

3. How are the environmental managers involved in or discouraged by efforts to introduce best (environmental) management practices such as innovative pollution prevention programs?

Background

Two histories converge in this dissertation: the first is my own interests and background in the field and the second is the history of environmental management in hospitals. My history in this field consists of over twenty-five years in the environmental field, specifically working with federal environmental regulation and management involving hazardous chemical and biological materials and waste. I spent twenty of those years specifically working in hospitals throughout New England, the Midwest, and the South. I spent seventeen of those years working as the Manager of Biosafety and Environmental Programs at the Dartmouth Hitchcock Medical Center (DHMC) in Lebanon, New Hampshire. A fourth of my time there was spent assisting other hospitals, and I found it professionally and personally frustrating that smaller, more rural hospitals consistently lacked the same resources available at DHMC, a tertiary care medical center. I left DHMC to pursue a doctorate, and to find ways to inform the process of learning for environmental managers and to improve their management practices. I intend to return to my work with hospitals to implement my research findings.

The larger history of environmental management comes into play in this dissertation in the 1970s, when environmental regulations focused on changing the corporate behavior of manufacturing. The environmental impact of service industries such as hospitals has also come under public scrutiny in the past decade. All industries were originally required to comply with federal environmental regulations, such as the RCRA, which dictates the management of hazardous chemicals. EPA inspectors in EPA Region I continue to find many hospitals that do not have any system in place to accomplish this level of compliance. While hospitals may potentially face fines for improperly managed hazardous materials and waste, what does this type of non-compliance mean for public health and the environment?

The consequences of non-compliance that I have witnessed included improperly disposed wastes in local landfills or in hazardous waste disposal facilities, all of which were located outside of New Hampshire. New Hampshire has not experienced a public image problem like New Jersey experienced when hospital needles were found on its beaches. That crisis motivated New Jersey hospitals to take corrective systemic action. The problems in New Hampshire exist as hidden hazards. The misperception that everything is in compliance because nothing is reported has created a false sense of complacency. Complacency and ignorance, both organizational and individual, have put people and the environment at risk and have created a demand that hospitals comply with environmental regulations or suffer the consequences of fines and bad publicity.

In addition to complacency and ignorance, another obstacle creates a challenge for environmental managers. There is an absence of clearly defined organizational, industrial, and professional standards. How do current managers manage hazardous materials appropriately, maintain their skills, and reach for innovation in the programs that they manage when a clear definition of the work and no clear performance standards are lacking?

The Hospitals

Half of the hospitals in New Hampshire are small (under 50 beds). I was especially interested in New Hampshire hospitals for three reasons. First, they are primarily rural, and yet, they still provide clinical services such as chemotherapy that are comparable to larger, urban hospitals. However, despite the urban clinical services they offer, they lack the environmental management skills found in urban settings. Second, they provide critical access to underserved populations, who live in these communities. There was an opportunity to learn about how people in underserved communities learn technical skills and how to identify and utilize the best tools that worked for their needs. And finally, I was interested in New Hampshire hospitals because they have the opportunity to make change from within their organization, instead of only reacting to external requirements. Unlike their neighbors, New Hampshire hospitals have the ability to make changes in many of their non-clinical operations without requiring a state-level budget review or additional scrutiny in public hearings. They have more flexibility in controlling and managing their decisions, priorities and operations as they use, manage and dispose of hazardous materials than hospitals in neighboring states.

Despite focus from the Environmental Protection Agency and the concerted efforts of non-profit organizations such as Hospitals for a Healthy Environment, New Hampshire hospitals have been slow to change their operations to meet regulators' expectations. No research study has asked the environmental managers of these small hospitals how they describe their job/career and how they learned to do their job in the absence of formal programs and certifications. Knowing how these adult learners do or don't access information can positively impact the compliance efforts being made by environmental managers and identify opportunities for innovative environmental programs in each hospital.

Contribution to the Academic Literature and Practice

Regulators have sought to quantify and correct hospital environmental non-compliance and have demonstrated that a lack of training is a common trait among the ten percent of New England hospitals that have been inspected in the last two years (Bowen, 2007a). Regulators focus on compliance outcomes and not on the process of learning. There is no academic equivalent to studies of how these environmental managers - who are responsible for the work that could be in violation - have learned their job. Is there an association between the knowledge of environmental managers and whether the hospital that they work at is in compliance with federal environmental management? There has been no fundamental investigation of why RCRA compliance within hospitals is not succeeding, despite large amounts of available and external technical assistance. Eisenhower (1990) discussed the complex challenge of defining and managing waste streams but paid little attention to the environmental manager's role within the system (Eisenhower, 1990). He identified the stakeholders and their jobs but did not address the organizational interaction or process of learning environmental management. The requirements of the work are discussed but its further development into a job and how it is taught is not discussed.

Two areas of inquiry help explain how hospital environmental managers learn their work. The first is the rich literature of grounded theory studies that have originated in hospital settings and education. Glaser and Strauss published two studies on dying in hospitals (Glaser & Strauss, 1965, 1968), beginning a long collaboration in medical sociology (Punch, 1998). The second area is qualitative work on management (Lorrain-Smith, 1981; Wilson & Bryant, 1997), change (Bennis, Parikh, & Lessem, 1994), organizational and personal learning (Argyris, 1992; Argyris & Schon, 1996; Garrison, 1997; Schein, 2004) and the diffusion of innovation (Rogers, 1995; Van de Ven & Polley, 1992). Both areas are well represented with either methodological or theoretical

literature but do not specifically inform the question of how environmental managers learn their jobs.

Previous organizational learning research has not focused on hospital environmental managers. This population is unique in a hospital because almost every other professional position in healthcare—clinical as well as support staff—requires a level of professional certification or assessment. Even individuals who wash operating room equipment undergo a professional certification process that requires them to pursue continuing education, training, and networking opportunities throughout their working lives. Individuals who manage environmental programs are required to have an in-depth knowledge of fairly complex regulations, economics, chemistry, systems analysis, and computers as well as other skill sets. Yet environmental managers do not have a nationally recognized certification or a program for professional training. Similar certifications for environmental management have existed in manufacturing for decades and a few efforts have been made to alter these programs for the use of hospitals, but those efforts have not been largely successful. Concurrently, the American Hospital Association is providing hospital environmental managers with technical assistance in the form of web-based programming. But without standard credentialing or data that demonstrates that technical assistance efforts have a positive impact on compliance, we do not know how to effectively help managers or understand how they bring information into their facilities.

This study triangulated interviews with environmental managers, regulators, and others to provide policy recommendations designed to attain and maintain environmental compliance. It will improve practice by identifying areas for future development of teaching materials or techniques. The study brings together divergent disciplines to understand how people learn in a situation when

values and technology compete for resources, while the potential for serious harm to the environment and the future of public health continue to grow.

CHAPTER TWO: METHODS

Introduction

Grounded theory was used to uncover the stories of hospital environmental managers. Through the emergence of themes, a theory was created to explain how environmental managers experience their professional world and how this influences compliance with federal environmental regulations. Grounded theory is an appropriate research methodology for this study because it places great value on the personal story behind non compliance. While the relationship between non compliance and economics, corporate ethics, and policy has been examined in great detail, no one has discussed it with the people responsible for compliance.

Grounded theory was used to identify common themes and the needs of environmental managers, their administrators, and regulators. Abductive, or explanatory reasoning, was used to generate conceptual categories to explain the phenomena of how hospital environmental managers learn their jobs and/or innovate (Haig, 2005). Grounded theory was a valuable method for understanding social interactions because it is focused on relationship and interaction. The integration of categories, sorting out what fits and what does not fit, helps construct a means of understanding relationships (Charmaz, 2006). Denzin (1970) stated that the job of grounded theory is to initiate new theory and that the method is a good fit when few or no adequate theories exist to explain or predict a group's behavior. In the case of hospital environmental managers, their perspectives and management practices were not understood, even though the potential negative impact of mismanagement has been well established.

Barney Glaser, (1998) sociologist and one of the founders of grounded theory, described grounded theory as an “integrated set of conceptual hypotheses” (p. 3) that creates “probability statements” (p. 3) about relationships between concepts. Stories and relationships create

descriptions which are “plausible” (p. 3) explanations of behavior. There are few theories explaining the how environmental managers learned their job within their organizations. Grounded theory practitioners specify concepts and their relationships and integrate the concepts into a substantive theory (Glaser & Strauss, 1967). The leap from substantive to formal theory involves humility and honesty of the researcher, “the wisdom of usually deceased great men,” (p.269) conjecture, and logical deduction (Glaser, 1994). Listening to the environmental managers describe how they learn, and what challenges that they face as they try to learn and maintain their skills, and the stories of how they overcome obstacles accomplishes the first steps toward a formal theory. Glaser and Strauss (1967) differentiated substantive and formal theory by the “distinguishable levels of generality” (p. 33). In seeking a formal theory, the stories of this group of hospital environmental managers would be compared to the stories of other hospital environmental managers.

Glaser (1978) once attributed the popularity of grounded theory to its ability to richly describe the world as it is, not as it ought to be. For example, hospitals are learning environments and have a high level of professional training and technical expertise available in their organizations. They also have a rich history of guild and specialist teaching in the clinical sciences. The same level of professionalism should be present (the world as it should be) in the field of environmental management, especially because that field attempts to minimize a hospital’s environmental footprint. Violations and fines throughout the industry have provided some evidence that this level of professionalism is lacking and the cause is not easily understood. The story behind hospital environmental managers’ professional lives in small rural hospitals and what they think will be needed to attain compliance has not been documented. Could a theory be generated to understand their experience that could perhaps be later tested with another group of

environmental managers? Might that make a contribution to a new area of inquiry? Sociologist and grounded theoretician Anselm Strauss emphasized the utility of grounded theory in understanding an individual's relationship to society and to history (Goulding, 2006).

Research Process

Phase One: Focus Group

A focus group was held to interview. The focus group was held during a regularly scheduled meeting of the New Hampshire Hospital Association. Participation was voluntary, and informed consent was sought and received (see Appendix B). Special emphasis was placed on learning and questions included the following: What was an ideal learning environment? How did environmental managers gain and maintain access to the information that they needed? What topical areas were of greatest interest and proved most challenging? Did hospital environmental managers believe that they needed help?

The focus group also provided feedback on the interview guide (see Appendix A). This group was a subset of the same managers who were later interviewed. The hospitals received an informal invitation to participate through the Hospital Association network and these focus group participants were self-selected. Environmental managers had the choice of meeting in groups or as individuals, but the interviews were all held in person. A group of ten individuals were interviewed using the attached interview guide. The interviews were recorded using a Sony Mini Disc recorder and then transcribed by the interviewer and a transcription service. From these interviews, a more detailed interview guide was developed to reflect the focus groups' interests and concerns. In addition, other areas of focus were identified, such as technical skill development or attitudes and values concerning the environment.

Phase Two: Selected Hospital Observations

There are twenty-six hospitals in New Hampshire, and most of these are small to moderate in size. The few larger city hospitals were not included for observation, because they operate on a much larger scale. Most of the remaining hospitals were contacted for observation and interviews.

All of the hospitals in New Hampshire were invited to participate through the Hospital Association, and those environmental managers who chose to participate were asked to give a tour of their hospital and an in-depth interview. Open access to New Hampshire hospitals was granted voluntarily by the New Hampshire Hospital Association with assistance from the (non-regulatory) Pollution Prevention Division of the New Hampshire Department of Environmental Resources (NH DES). I offered each some assistance for observed minor issues after each interview was conducted. A contingency was planned to address observed cases of non compliance, by speaking with the manager about the observation before the interview. No serious compliance issues were observed during the observation or interview. There were several minor issues, which were addressed immediately with each manager.

The observation focused on areas of hazardous material use, storage and disposal, and areas where other solid wastes are generated or stored. Three types of areas were generally observed: patient care sites, auxiliary areas that provided clinical services to the facility—such as a laboratory, and facility management areas such as garages or waste sheds. The observations and interviews created a baseline for further work with the environmental managers.

Phase Three: Interviews

Managers were interviewed extensively in their own environments or at a neutral location, if they preferred. Regulators, insurers, state officials, and co-workers were also interviewed to gain further perspective on the issues identified by the environmental managers.

Eleven people were interviewed, with the majority of the sample consisting of hospital environmental managers currently working in rural New Hampshire hospitals. They were asked to commit a minimum of three hours to the study: one hour for observation, and two hours for the interview and tour. I used open questions and probes when needed to help keep the research on track.

Once the recording was transcribed, it was saved as a Microsoft Word document and the original recording was erased. The printed transcript was kept for coding.

Phase Four: Data Analysis

While the interviews were managed electronically, coding was done on 3 x 5-inch note cards, kept on a table in an office. There were three stages in coding the data, following Glaser and Strauss' (1967) classic grounded theory coding process.

Stage One: Open Coding

The interview transcriptions identified initial categories of information. Notes, comments, and memos were written on the transcript copy margins. General conditions were listed after a review of the transcripts. The properties of these categories were also noted. For example, if managers identified fear as a common aspect of their experience, how did fear manifest itself? How extreme was the fear that they described? Memos required conceptualization concurrent with assessing how concepts fit together. In addition, a journal was kept with a list of additional questions or comments that arose during the interviews. These journal entries created the second

tier of an audit trail—with the first being the raw interview data. Once the first coding was complete, the categories were written onto white 3 X 5-inch note cards. Words that described the action in the setting were selected, and each sentence was coded to break the data into small pieces. The code locations appear on Appendix C, code lists on Appendix D, and code frequencies on Appendix E.

Stage Two: Axial Coding

The second sort of data was done by arranging and rearranging the categories into similar groupings. During this sort, central phenomena were sought within the categories. Categories were essentially condensed open codes and represented a first level of abstraction of the data. From this sorting, a diagram was created on paper. Core variables were identified and listed. Strauss (Strauss, 1987) lists six characteristics for core variables: a) it recurs frequently, b) it links the data together, c) they explain much of the variation in the data, d) they have broader implications for a more general theory, e) as they become more detailed, the theory moves forward, and f) the core variables allow for the maximum variation in analysis.

Strauss (1987) recommended intertwining basic social psychological processes—core variables that illustrate social processes over time, despite varying conditions—with basic social structural processes. This method of combining approaches worked well for this population, because it was important to recognize and understand that these managers work within a richly structured workplace. Different personalities and organizational behavior were equally relevant to this study.

Stage Three: Selective Coding

From the initial categories, memos, journal and diagram, a flow chart was created that would become a theory of how the managers experienced their world. The constructs were derived from the creation of theory and the validation from existing literature. A theory was derived from this to explain why non-compliance with environmental regulations is so pervasive with this population. The need to formulate a theory as it emerges from data required no preconceived notions of how these managers thought and worked. The development of theoretical sensitivity required a persistent reevaluation of coding and an alteration of disposition from practitioner to theoretician. Glaser (1978) used code families to strengthen theoretical sensitivity. Strauss (1987), and Strauss and Corbin (1990) used coding paradigms to generate subcategories. Paradigms are schemes that help organize data in order to find structure. Strauss and Corbin further expanded the use of this device by breaking it into three components: *conditions* (why, when and where); *actions/interactions*, which are responses from individuals or groups; and *consequences*, the outcomes of the actions and interactions. An example of one paradigm was that managers in small rural hospitals lack the ability to understand and implement federal environmental regulations. The *condition* is the size and scale of the hospitals' operations, the *interaction* is the lack of ability, and the *consequences* are the lack of compliance.

After all interviews were conducted and analyzed, initial findings were shared with the Hospital Association. They were provided with data, analysis, and recommendations. The data did not identify the individual facilities.

The Contribution of Critical Theory

Critical theory (Held, 1980) was originally examined as a means of understanding how a hospital distributed power. Critical theories share an interest in the distribution of and challenge to power structures. Early discussions with environmental managers led me to believe that many of them worked independently and that they were allowed a great deal of autonomy, dismissing my initial belief that a greater research emphasis on power structures would be the most informative.

Both grounded and critical theory share common ground in their concerns regarding essential structural change (Denzin, 1970). My primary goal was to understand how the environmental managers learn and perceive their work. Grounded theory addressed the gap of knowledge by allowing others to describe their world through their daily experience. Glaser and Strauss (1967) offered the alternative of “discovery of theory from data systematically obtained and analyzed in social research” (p. 1) in order to fit the situation into the theory and not allow a priori assumptions to influence the outcome of the data.

Limitations of Research Approach

Grounded theory has been criticized because it does not hold up to the rigors of testing (Charmaz, 2006). This statement might be valid if the critics were referring to quantitative research tests of rigor. Glaser and Strauss (1967) stated that grounded theory produced “often sufficiently plausible” (p. 233) results which could become participant to “empirical determination” (p. 233) as to how further testing could be conducted; through means such as field work, experiments, or other methods. Testing rigor is critical in establishing trust that the research outcomes are sound, regardless of the method used.

Credibility

Validity in qualitative research has been addressed in what Lincoln and Guba (1985) called “truth value” (p. 294). They explained that truth value offers an alternative means of testing rigor in qualitative inquiry to establish trust in the outcomes and to determine whether the research is credible. Truth value is the qualitative mirror equivalent of internal validity in quantitative research. This study focused on the behavior of people, especially people who knew I was coming to speak with them about potentially questionable aspects of their job performance. Establishing credibility was of great importance. My presence could distort observations. My previous work history could influence how they responded. I may have had personal bias that would also impact the research findings. By allowing these potential problems to be present when making interviewing, coding, or other decisions and keeping a written log of how and when these issues arose allowed me to demonstrate to others that these issues were consciously addressed as they arose.

Researcher bias is a reminder that research is of human beings by other human beings. It comes with its shortcomings, but also has the potential to tap into creativity and an intuitive sense—supported by literature—of what is important in the data. Glaser and Strauss (1967) noted that theoretical sensitivity, or the insight and ability to recognize what is important in the data, is derived from two sources. The first is personal grounding in the literature, and the second is a continual interaction with the data. While the data drove the storyline and generated theory, the grounding literature illuminated and validated findings. In qualitative work with human participants, the truth can be difficult to determine. Truth value is found in the stories that are told by they themselves, rather than in verifying any preconceptions of their experience. Truth value is

defined by the participant, not the researcher. Credibility replaces internal validity as a means of testing rigor, and it is established when the story is recognized by the study as their own.

The triangulation of interviews provided a reality check as I spoke to co-workers, bosses, and regulators who worked with the environmental managers. Observing and recording the environmental management practices enabled a comparison of the description of a program with the physical observation of the program. Triangulation of interviews and cross checking of observed and described phenomena established structural corroboration in the data.

Fittingness

Potential shortcomings of grounded theory are that it cannot be replicated and that it is not generalizable. There are two perspectives of fit. Lincoln and Guba (1985) described how grounded theory fits into the larger context of naturalistic inquiry by placing it in a cycle that is repeated until it is redundant. Purposive sampling, inductive analysis, grounded theory, and emergent design sit within this cycle. Grounded theory is the best means of entering this flow of naturalistic inquiry when there are no theories to explain phenomena. Lincoln and Guba explained that grounded theory is a means to enter into a scholarly conversation but not the ends; until all four parts of the cycle are complete, an outcome cannot be negotiated. Through the grounded theory method, an emergent design can be created and tested, thus creating a model that can be replicated in the future. This research population represented a unique group of people, and the findings were not generalizable about other similar groups, especially those who work in urban or large hospitals (more than 50 beds). Once a theory is generated, additional work could be done to test the theory, creating a hypothesis that could be tested and research that could be replicated. The initial task of generating a theory is a good beginning.

In the second perspective of fit, Guba and Lincoln (1981) suggested that fittingness be an evaluative criterion, to determine whether research findings agree with other contexts outside of the research. In testing the rigor of qualitative work, consistency cannot be used as a defining criterion because, in quantitative work, human participants are simply not consistent by nature.

Auditability

Lincoln and Guba (1985) offered auditability as an alternative means of testing rigor because it challenges the researcher to maintain a trail of decisions made along the way. This trail serves as a path that others can follow to understand how the researcher reached her conclusions. I created a tiered audit trail. The first tier was notes from observations and transcripts from interviews. The second means of documenting my work was in the coding and memoing process. These techniques would allow another researcher to see how I made decisions along the way.

Confirmability

While quantitative research places high value on neutrality, it is the intentional relationship of researcher to the participant in qualitative research that is of importance. Subjectivity must be more important than objectivity and the direct engagement with the participant is a legitimate means of testing rigor.

Confirmability, the aspect of naturalistic inquiry that encompasses how a researcher balances objectivity and subjectivity, was addressed in my interviews, observations, and coding of data. Researcher bias could have led the storyline in alternate directions despite continual exposure to data. Previous work with the environmental managers could have influenced the observations and interviews. Setting aside bias during data collection was crucial until initial analysis was complete. Personal reflections were kept in a journal that placed feelings into context and maintained an awareness of how subjectivity influenced inquiry. I used Schatzman and Strauss'

(1973) four note-taking techniques to address grounded theory research. I used personal, methodological, observational, and theoretical notes as procedural techniques for tracking how I would make decisions and draw conclusions. Substantive theory arose from the data, not the literature. Researcher bias was a possibility that needed to be addressed by journaling present and past experiences with the environmental managers. My bias was that I wanted my colleagues to succeed. This bias was held in check by my professional responsibility to report any serious compliance problems that I observed.

Sample Selection and Ethical Protection of Participants

This was a small sample population—13 of the 26 hospitals had 25 beds or less, maximizing the discovery of variations in the grounded theory category properties. Participants must have had professional responsibilities that included environmental management, despite their job title or other duties. The primary participants must have currently worked in one of the New Hampshire hospitals. Triangulated interviews expanded the population to include compliance (inspectors) and non-compliance (pollution prevention specialists) professional staff from state and federal environmental protection agencies (EPA Region I and the New Hampshire Department of Environmental Services).

I was concerned about the individual and their frank descriptions of their work and personal lives. To protect the participants against their own candor, they were required to sign an informed consent (Appendix B) before the interviews and observations were conducted. The strong potential for observed non-compliance was cause for concern for the larger organizations as well. Confidentiality was protected by the following methods. Facilities or individuals participating in the study were not identified. Data released to the hospitals and to the New Hampshire Hospital Association did not identify facilities or individuals. Smaller non-compliance

issues were addressed in person by the researcher and the facility's environmental manager and, whenever possible, corrected on-site. The observations were a backdrop for interviews and did not generate quantitative data about compliance activities. For example, a manager may have proudly described a program, but when the program's activities were observed, deficiencies were observed in the program. This type of situation provided questions about knowledge, internal compliance, staffing, and other organizational influences that affected the daily operations of environmental management to emerge during research. Observation procedures and use of an interview guide were combined with field notes, interview transcription and reports of the tour and assessment. When used at various points in the research project, they created the means to turn data into storyline and storyline into theory.

The same consent form was used for interviews with persons who were not environmental managers: their participation was limited to an interview, with no observations of their work.

CHAPTER THREE: LITERATURE REVIEW

Introduction

Since there is no clearly defined literature for hospital environmental management, I used three different areas of literature in this research. Adult learning theory most directly influenced my understanding of the learning process that hospital environmental manager's experience. This is my primary reference in answering my three research questions. This literature focuses on the individual learner. It explains phenomena that help to piece together the puzzle of learning. I have reviewed other fields and brought together divergent pieces of literature to explain the phenomena of learning that hospital environmental managers undergo throughout their careers.

The two other areas of literature helped to frame the context of my work, and while they do not support my claims as strongly as that of adult learning theory, they do help to explain the complexity in which the managers work and learn. These works are practice oriented, applied literatures in management (organizational change), and anthropology (culture). They also operate at increasingly larger scales and are more generalizable. Moving from the adult learning theory and the individual, I utilize the literature of the hospital culture, then the literature of generic organizations as they learn and change. Understanding how the culture of a hospital encourages or discourages learning has an indirect but potentially substantial impact on learning. Within this literature is a rich discussion of the subcultures and traditions within the hospital, of how authority and loss of control impact learning, and of how the linkage of ethics and mission can encourage learning.

Applied literature addresses learning organizations and community of practice. This work informed my finding of the innovative process of learning, and while it represented a small minority of hospital environmental managers as learners, it was the strongest indicator of

successful learning and positive change. This literature describes how the learner becomes a teacher, and takes a leadership role in promoting and diffusing innovation. It requires a certain level of personal mastery and commitment to mission.

Finally, I access the literature of the larger field of environmental management and how the field itself is being addressed by contemporary literature as it matures as its own field of inquiry. *Environmental management*, in this case, defines a body of work that includes the outside environment, minus the people. My use of the term *environmental management*, in the context of hospital managers, includes social and natural concerns. It is this schism that scholars address in the contemporary literature that I have selected, with a call to incorporate the natural world into the occupational and people back into the natural world, thus creating one whole term to describe this important work.

Adult Learning Theory

The study had three groups of research questions and associated findings: readiness to learn, maintaining skills, and innovation. The adult learning theory presented below follows each research question.

Readiness to Learn

Informal Experience

Adults bring a diverse background of experience to a new job, and this has a big impact of how quickly they can become oriented in a new workplace, learn what is expected of them, and then move forward to acquire resources and accomplish work. Jarvis (2006) encouraged us to see experience as a learning tool that begins at birth and builds through one's growth and maturation. The richness of these experiences can empower a person to be a confident, self directed learner. Knowles (1968) defined "adulthood" (p. 351) to mean a person who is capable of self direction.

Negative experiences with learning can cause a person to avoid situations where learning or the demonstration of learning, such as public speaking or exam taking occurs. Knowles explained that adults have come to expect respect in a learning situation, and when this does not happen, they may avoid future learning opportunities.

Jarvis' (2006) model of transformation through experience incorporates the experience of self and environment and of thought and action. A person's "lifeworld" (p. 6) informs the future capability of a learner. Many of the hospital environmental managers did not have extensive formal education or technical training before coming to work in their respective hospitals, but they commented that other previously learned skills, in other areas outside of what skills they presently needed, made them enthusiastic to jump into a new challenge. In the 1930s, Lewin (1948) pulled together topology (lifespace), psychology (aspiration), and sociology (motives that are based on group pressures) into what he described as "field theory" (p. 212). His work formed the basis for much of the work in adult learning theory and requires that the learner be considered a fully dimensional being.

The training and technical assistance that is currently available today involves technical problem solving skills, that are closely aligned with engineering or regulatory approaches to problem solving. Implementation and evaluation represent the final steps in learning.

Control

The study of overloaded adults as learners is extensive for general populations. For example, a doctoral study that interviewed people walking on a street on a given Saturday (Wolfen, 1999) found that 77% of people who were stopped and interviewed met the researcher's criteria of overload, which was determined by a stress inventory and a questionnaire. Wolfen's work was based on that of McClusky(1970), who developed a theory of margin. McClusky's theory

described overload as a ratio of available resources to self demands and pressures. The theory originated in 1963. The margin in life took into account both what was brought into a person's life and what was taken via the demands of life itself.

Family support gave a person internal power, even when they had little professional power at work. McClusky explained that increasing power or decreasing load would increase a learner's margin. For people to learn there must be some margin present, according to McClusky (1970). Overloaded adults did not have margin and would not be able to absorb information or retain what they learned. Acute or chronic stress and other personal factors had a direct impact on overload and could be significant barriers to prevent people from being ready to learn. McClusky described margin as "surplus power"(p. 82).

Powerlessness

Powerlessness is a belief that one has little control over their life. This can include learned helplessness, the expectation that one will be cared for and manipulated by others. People who are powerless do not have access to resources or influence. They are dependent learners and may not be able to differentiate or prioritize information. People who have adopted learned helplessness as a management strategy can't solve problems—they are often the problem themselves. Learned helplessness occurs when external reinforcement stops a person's efforts. The person gives up, often experiencing depression or despair. Gardner and Stern (1996) stated that a sense of personal control is critical to one's psychological health.

Hagberg (2003) attributed powerlessness to a person's sense of victimization. I could not find literature which discussed environmental managers in any service industry within the scope of victimization. There was, however, an abundance of literature on workers in natural extraction

industries such as asbestos mining and on other “invisible workers.” This literature focused on workers, not managers.

Powerlessness has a positive and negative aspect, according to Hagberg (2003). In its positive aspect, a learner has lots of opportunity to change and grow. This can be done by developing one’s own self-esteem, by finding allies, and by gaining confidence. By finding another person in a similar developmental phase, a learner can avoid isolation and seek mutual goals with another person to the benefit of both people. This interdependence can be negative or positive (Lewin, 1948). The positive characteristics of interdependence bring people together for a common cause and bolsters personal self esteem and group cohesiveness. In his study of self-hatred in Jews, Lewin (1948) found that negative interdependence also existed. Every success meant that someone would fail and not have their needs met (perhaps becoming invisible), and learning would fail because most of its underpinnings were eroded by competition (Brown, 1988). It is often the marginalized person who learns not to take personal responsibility for their own learning, thus fulfilling their own prophecy of failure (Hagberg, 2003).

If a person has failed in the past, it is reasonable to assume that they will fail again. Each time this occurs, a person’s belief is reinforced unless they choose to change their perspective (Gold, 1999). Argyris (1992) calls this phenomena theories-in-use. The successful challenge of this concept is discussed later under the section called Maintaining Skills, in this chapter.

Perspective

Learners who are experiencing overload can learn as well as those who do not describe themselves as stressed out. Wolfen (2003) disputed McClusky's (1970) prerequisite that surplus power be present before learning can occur. For almost thirty years, scholars accepted McClusky's conclusions about surplus power, until Wolfen demonstrated that surplus power was not a "necessary condition" (p. 281) or "crucial element" (p. 281) for adults to be ready to learn.

Motivation and search for meaning are addressed in Illeris' (2004) model of the learning process, which pulls together cognition, emotion, and societal influences on learning. Illeris' concept of cognition includes all ways of knowing, not just formal education, and unlike McClusky (1970), he places learning in a continuum of emotion, where learners are more or less likely to be able to learn, despite their life stressors. Illeris' model places equal importance on the acquisition of skills and personal sensibility and the ability to successfully interact with society.

Maintaining Skills

In this phase of learning, managers are actively acquiring skills, overcoming barriers and creating their own practice. To be successful, they need to question their previous assumptions about how things work in the world. They also need to reach beyond themselves and engage with individuals who will support them or complement their skills. They need to become confident and self-directed learners. To understand this process, Argyris and Schon's (1996) theory-in-use and single and double loop learning theories can be found in Table 1. Questioning assumptions about the world, engaging with others about that world, and gaining confidence to move forward with a new understanding about that world help the manager to make sense of the skills that they are acquiring, and helps the manager to put their skills into perspective (Senge, 1999).

Table 1.

Argyris' Model I: Theory-in-Use

Values	Actions
Achieving your intended purpose	Advocating your position
Maximize winning and minimizing losing	Evaluate the thoughts and actions of others
Suppress negative feelings	Attribute causes for what you are trying to understand
Behave according to what you consider rational	

(Argyris, 1993)

Note. From C., Argyris, 1993, *Knowledge For Action: A Guide to Overcoming Barriers to Organizational Change*. San Francisco: Jossey-Bass.

Theory-in-use reflects on what is construed as reality and how things are expected to happen, and that expectation is reinforced by observation so many times that it is assumed that it is reality (Argyris, 1993). A learner needs to question assumptions as a means of growth and maturation. Within theories-in-use, there are two models. The first model, Model I, (Table 1) has four universal values: achieving one's intended purpose; maximizing winning and minimizing losing; suppressing negative feelings; and behaving according to what one believes is rational (Argyris, 1992). If a person behaves in this manner, Argyris contends, a person will achieve a minimal sense of control, but at the expense of defensive, misunderstanding, and self-defeating attitudes (Argyris, 1993). This model reinforces defensive patterns that limit a learner to single-loop learning.

Single and double loop learning were greatly expanded upon in application by Argyris (1993) but was originally described by Ashby (1960) in his seminal work *Design for a Brain*.

Single loop learning refers to a change of action or learning that leaves the underlying values intact, where theories-in-use are not challenged (Argyris & Schon, 1996). A learner takes an action or uses a tool to solve a problem, but does not challenge why the problem exists. Single loop learning does not challenge theories-in-use. The existence of the problem, the theory-in-use, is not questioned.

In Model II of Argyris' theories-in-use, the values beyond the action are challenged. A second loop is added in the learning process in which the learner challenges the theory-in-use and asks the question "Why am I doing this?"—and thus, begins the process of reframing the question and examining the underlying values of the learning experience.

Theories-in-use indicate that promulgating more environmental regulations are how environmental problems are solved. Bennis, Parikh and Lessem (1994) challenge this theory –in-use with their business paradigm of ethics, economics, and ecology. Instead of solving the compliance problem by following regulations, they challenged the assumption that required them to work with materials dangerous enough to require additional regulation. Argyris' (1994) model of double loop learning demonstrated how reframing and answering questions changed perspective entirely.

Moving away from dependence and becoming self directed is one of the qualities that Knowles (1968) used when he first described what adult learners needed to become successful: a) as a person matures, his or her self-concept moves from that of a dependent personality toward one of a self-directing human being, b) an adult accumulates a growing reservoir of experience, which is a rich source for learning, c) the readiness of an adult to learn is closely related to the developmental tasks of his or her social role, and d) there is a change in time perspective as people

mature from future application of knowledge to immediacy of application. Thus, an adult is more problem-centered than participant-centered in learning.

Grow (1991) takes self direction one step farther by creating a model, called the SSDL Model (Staged Self Directed Learning), which shows the relationship between self direction and the appropriate level of delivery of teaching material. He also defined readiness to learn as both parts ability and motivation. Dependent learners need introductory material, lectures, and drills with no requirements for interpretation or critical thinking. Grow's (1991) "interested learner" (p. 129) can be reached through more motivational means of delivery but still requires a lecture format. They want to begin applying what they are learning and need facilitation, team work, critical thinking, and strategies to keep them engaged. And finally, self directed learners want to work independently, using an instructor as a consultant.

Gardner (1999) noted seven forms of human intelligence, including the linguistic, logical-mathematical, musical, spatial, bodily-kinesthetic, interpersonal, and intrapersonal. He later added an eighth intelligence, that of existential intelligence—a concern for the very big picture.

Grow (1994) was harshly criticized by Tennant (1992) for characterizing learners neatly into four groups and for suggesting that dependent learners are somehow lesser than self-directed learners, apparently hitting a scholarly nerve in the education field. As Grow (1994) stated in his defense, he used a survey to quantify a diagnosis—which was fraught with anxiety for the learner and sometimes the teacher alike. Knowles (1968) stated that moving away from dependence was an important aspect of growth, despite the angst that the process was capable of generating.

Garrison (1997) offered a model, called a Comprehensive Model, of self directed learning, where learners utilized self-monitoring in taking responsibility for their own learning, reflection,

and critical evaluation. Self-monitoring, motivation, and self-management worked synergistically to promote self-directed learning. Garrison believed that task control, cognitive responsibility and motivation were equally important factors for learners to become self-directed. By integrating the “textual, cognitive, and motivational dimensions of the educational experience” (p. 29), Garrison sought to improve the quality of educational outcomes.

Mentoring

An adult’s journey from dependent to a self-directed learner is made more smoothly by the presence of a mentor. Power of Association is the second stage of Hagberg’s (2003) personal power scheme, where a person begins to reach out to others as they learn the culture that they are encountering. Hagberg (2003) described the learner as a dependent apprentice, in need of a more experienced guide to help them achieve a level of competence in both technical and organizational navigation. Mentors help bridge the personal and professional gaps in knowledge and confidence as a person learns and grows. Kram (1988) noted that mentoring can be a reciprocal relationship because it promotes career enhancement and personal development.. It is the ability to reflect and show compassion that enables one person to guide another. Having a mentor allows a person to focus on achievement and control and to begin building networks, also referred to by Hagberg’s third stage, called Power of Achievement. She noted that people need to reach the fourth stage, called Power of Reflection, before they themselves can become good mentors and leaders.

Innovation

The theories of readiness to learn and maintaining skills, subjects of the first two research questions, have been firmly grounded in adult learning research. Moving into a discussion of the informative literature about innovation required a shift toward literature more oriented to applied theory than strictly formal theory. The third research question subject asked how managers are

challenged by or successfully incorporate innovation into their work. The literature review examined the mental models, mind sets, and paradigm shifts that are used to describe innovation.

What is innovation? Rogers (1995, p. 12) defines it as, "...an idea, practice, or object that is perceived as new by an individual or other unit of adoption. Rogers' Innovation-Decision Process model originated in the agricultural studies in the 1940's conducted by Ryan and Ross (1943) on Iowa seed corn. Rogers (1995) used their work on the adoption of innovation of the use of a new seed corn in Iowa and refined it into a sequential process with five stages: a) knowledge - individuals are exposed to an innovation; b) persuasion - they form a favorable attitude toward the innovation c) decision - they decide to incorporate the innovation into their life, d) implementation - they implement the change and e) confirmation - they evaluate the change's effectiveness. Atchison and Bujak(2001) noted that Rogers' innovation diffusion model explained behavior for groups that valued consensus. Berwick (1996) noted that "between 49 and 87 percent of the variance in the rate of spread" (p.104) is attributed to perception of an innovation, with five specific perceptions found to be the most influential. The perceptions were perceived benefit, the innovation's compatibility with existing values, the simplicity of the innovation, trialability - the ability of a person to try a bit of innovation before having to commit to it fully - and observability (Berwick, 1996).

Senge (1990) compares the term innovation to invention: "Engineers like to say that a new idea has been 'invented' when it is proven to work in the laboratory. The idea becomes an 'innovation' only when it can be replicated reliably on a meaningful scale at practical costs" (pp. 5-6). To bridge the gap between invention and innovation, Senge (1990) explained, the field of engineering required that five "component technologies" (p. 6) be present: systems thinking, personal mastery, mental models, building shared vision, and team

learning. These human technologies provided the theoretical continuum that defined the learning process. To master and nurture the requisite technologies of innovation, a learner must have incorporated these practices into their professional life.

Atchison (2005) created a model called the Synergy Factor which incorporated the tangible realities of providing healthcare with the intangible dimensions of trust, respect, pride, and joy. “Synergy is ... the unknown that converts the four dimensions into a powerful force. Leaders who display this dynamic are alchemists – they transmute individual parts into something unique and valuable” (p. 51). Atchison (2005) attributed 65% of these intangibles –trust, respect, pride and joy -for the organizational success of a hospital, the reason and purpose of working, and the improvement of one’s performance. All of these elements arise from individuals, including the managers who are responsible for the environmental footprint of the hospital. Atchison (2005) noted that healthcare is a place where people do not want to “choose to spend their time, energy, and money in a hospital ... as they do willingly in other industries. “Those who elect to work in healthcare are special in they make themselves available to help those who do not want to be there” (p. 50). Their shared vision drives their desire to help others in the best way that they are able (Bennis et al., 1994). Bennis, Parikh and Lessem (1994) described innovation as:

“the mythological hero’s outward journey, from the call to adventure on to the acquisition of power. Innovation represents his or her return. In other words, having ascended Jacob’s Ladder, rising up from action to vision, he now descends the ladder, this time turning vision into action. This descent constitutes the process and substance of innovation” (p. 95)

Innovation is brought about by reflection of current practice, recognition of values and mission, and then through work that positively affects ecology, economics and ethics. Bolman and Deal (2003) offer the many names of this process: “...mental model, maps, mind-sets, schema, and

cognitive lenses,” (p. 12), although they used the label *frames* to describe the set of assumptions that an individual has in their own mind.

Much of the work related to innovation is based on the systems thinking work of Senge (1990), which “...integrates the disciplines, fusing them into a coherent body of theory and practice” (p.12). He described systems thinking as “a discipline for seeing wholes” (p.68). A part of systems thinking incorporates mental models which involves testing and changing the internal pictures that all people carry around in their minds to explain how the world works. Mental models can be simple explanations or complex theories, such as Argyris’ (1993) theories-in-use.

Systems Thinking

Any manager can become a leader, but those leaders who wish to have followers, as Senge warns (Senge, 1990), need to be able to open themselves up to a larger mind-set. He called systems thinking the “Fifth Discipline” (p. 12) —the ability to see the whole instead of just seeing parts of a situation.

Another description of systems thinking came from McDonough and Braungart (2002), who used the term eco-effectiveness to describe the union of equity, ecology, and economy. This trinity created a system where people were respected as much as the built or natural world. These three entities comprised the context of how things exist in their life cycles. It recognized that people and the environment were always present in an evaluation of technology.

This grounding allows a person to ask bigger scale questions of relevance, value and vision. Heifitz and Laurie (1997) stated that “...the prevailing notion that leadership consists of having a vision and [that] aligning people with that vision is bankrupt because it continues to treat adaptive situations as if they were technical..” (p. 59). Adapting to change requires the recognition

that people do not exist in a vacuum, but rather in a complex system that is interdependent and entwined (Bennis et al., 1994).

Hospital Culture

Hospital organizational culture represents a complex system that has its theoretical roots in anthropology. Its literature provides a rich history of how hospitals were incorporated and how physician and nursing practice has developed. Hospitals are conglomerations of many subcultures which have their own independent histories. Understanding how these groups learn provides some insight into how environmental managers need to navigate this complex system in order to learn, maintain their own skills, and provide opportunities for innovation to occur.

Rothstein (1985) provided a historical view into how physicians in the nineteenth century considered public health initiatives to be challenges to their control. Concern about the environment, such as sanitary living conditions and safe drinking water supplies, were not of physician concern despite the formation of public health boards during the nineteenth century. Once public boards of health demanded the involvement and support of the American Medical Association in 1878, physicians realized that they were about to lose their autonomy. The public boards threatened the physicians, who “realized that they [the public boards] could be used as licensing agencies to control the supply of physicians” (Rothstein, 1985, p. 311).

In Chambliss’ (1996) extensive study on the social organization of ethics in hospitals, he investigated the roles of nurses, another subculture within the hospital. He noted subordination and lack of respect within the hospital organization have not silenced the nursing profession’s advocacy for patient and environment, be that the environment within the hospital building or the community in which the patient resides. The “situational” subordination (Chambliss, 1996, p. 74) varies dependent on the specialty area, and the nurse’s “status hierarchy” (Chambliss, 1996, p. 75):

the lack of respect from physicians is “nearly universally felt and resented” (Chambliss, 1996, p. 75).

The relationship between these two main subcultures within the hospital creates tension and challenges for other professional staff who are trying to learn, accomplish, or implement programs that involve nurses or physicians. Embedded in the organization are the environmental managers, the individual persons or few people who manage the environmental programs for the hospital, managing hazardous materials, waste, health and safety and emergency planning as well as permitting for fuel storage, water and waste water, pest and air pollution control.

The concept of professional environmental management in hospitals is at least a decade long. It began as a national movement through a Memorandum of Understanding between the federal Environmental Protection Agency, the American Hospital Association, the American Nurses Association, and Healthcare Without Harm, an international non-profit organization, on June 24, 1998 (Memorandum of Understanding, 2001). The Memorandum set goals for five years ending in 2006 and brought together stakeholders to implement pollution prevention efforts. It was the first time that the leading American organizations representing hospitals, environmental regulators and healthcare advocacy groups publicly committed to working together for a common goal while recognizing the synergistic role that they played in improving environmental performance in healthcare.

Pierce and Jameton (2004) illustrated how a sustainable healthcare facility could look like in the near future: it has a strong emphasis on justice and equality, and it implores clinicians to carefully consider their responsibility to the environment as they practice medicine.

Organizational Learning and Change

The hospital environmental manager needs to acquire individual knowledge to accomplish tasks, but also to learn from and teach others in the organization. For example, the manager needs to create waste management systems, monitor them, and constantly communicate how the systems operate with staff members. They need to be familiar with the norms of communication and with how to access people, especially physicians who are working with patients all day. In Petak's (1980) study of the effectiveness of environmental managers, he found five "forces" (p. 287) that simultaneously constrained and stimulated the efforts of an environmental manager: a) technical concerns, such as attempts to quantify that which we know little about, b) sociopolitical pressures, c) federal, state, and local government requirements, d) conflicting and interdependent policies and programs, and e) management strategies that have not been verified or proven because of insufficient field testing. An environmental manager must acquire navigation skills early and learn how the hospital functions as a learning organization as well as to master the skills of the job: both navigation and technical skills are critical to success (Petak, 1980).

Atchison's illustration of the cultures of a hospital indicated that communal learning is not the norm and that most learning and continuing education happened within each subculture with little crossover (Atchison, 1990). Because environmental managers were usually not members of the dominant subcultures within a hospital, they needed to learn the language and norms of each group in order to gain credibility, trust and access to decision makers over time. Petak (1980) found a split between the approaches, focus, variables, tools and outcome attributes between more traditionally trained engineers and holistically trained environmental planners. The latter utilized a systems approach and were more ecologically oriented, while the former employed technological approaches. If technically oriented environmental managers did not utilize skills found more often

than not with professionals with more qualitative and holistic backgrounds, did they fail in gaining the credibility that Atchison (1990) claimed was vital to their success? Adult learners are adaptive and whether a person has initial skills training, or picks it up along the way, it doesn't seem to make much difference, argued Van de Ven and Polley (1992).

Wenger and Synder (1994) described a community of practice where learning was promoted in non-traditional ways by crossing cultural barriers. Communities of practice were informal groups of people brought together by a common interest, and the group lasted only as long as the group decided they were necessary. Knowledge was a shared commodity and open problem solving was done as a group. In the Middle Ages, guilds served a similar purpose, and while guilds still exist in hospitals, membership is restricted to physicians. Physicians set their own agendas and selected their own leadership, acting as autonomous units where new ideas could be developed with less external influence. This protected their values, traditions, power, and control from outsiders.

Kotter (1996) warned against promoting organizational learning through less than effective, low-credibility approaches. Efforts to promote organizational learning needed to be perceived as vibrant, relevant, and supported by top management. If the environmental manager did not communicate value in organizational learning, the recipients might not even attend. This reinforced the theory that overloaded learners will make themselves available if they perceive that the learning is relevant and valuable.

Environmental Management

Environmental management is a relatively new field brought about to manage or control pollution. Bryant and Wilson (1998) criticized the field as being limited to providing fixes without an understanding of root causes, culture, politics, or economic issues.

Environmental management originated from the need to eliminate pollution caused by industrial activities, and its primary focus was in creating solutions based upon immediate problems. The reactive nature of this approach, combined with an emphasis on problem-solving, continues today. This western, positivist approach is criticized by Bennis, Parikh and Lessem (1994) for addressing only half of the problem. Controlling and preventing pollution, without regard for the social aspects of this problem allowed the techno-centric problem-solving management approach to become embedded into corporate standard operating procedures. Development of the field was constrained because human-environmental interactions were not recognized as being critical in creating solutions (Bryant & Wilson, 1998). The assumption continues that environmental problems are able to be addressed without changing any “broader political, economic, or social forces” (p. 323).

Perhaps this explains, in part, why service industries such as hospitals are so poorly served by environmental regulations that were promulgated for the manufacturing sector. In manufacturing, many hazardous materials are used in large volumes, with tight engineering controls and access given to highly trained individuals. In healthcare, small amounts of hazardous materials are used by many individuals with little controls and open access (Anonymous, 2005). Many of the hazardous materials used in healthcare are used in very small units, such as vials or syringes. At these volumes, they are therapeutic. An example is nitroglycerin. Nitroglycerin is used as an explosive, but in healthcare since 1878 it has been used as an effective treatment for angina (Sneider, 2005). In healthcare, nitroglycerin is administered in tiny doses via sublingual, transdermal, oral or intravenous routes. Nitroglycerin’s cumulative stored quantities often trigger regulatory thresholds that require the hazardous material be managed as if it were used in manufacturing quantities in single

source areas. However, nitroglycerin supplies are rarely stored in one location: patients could have chest pain wherever they happen to be. Medical doses are individually packaged in three layers (small doses sealed in a bottle, in a boxboard box, in a larger cardboard box). The potential for environmental harm is not comparable for small unit doses in three packages, stored throughout the facility, and swallowed by individual persons [no waste] as it is for nitroglycerin in the manufacture of explosives, for example. Until recently, the two materials were regulated in the same manner. Medical nitroglycerin was removed from the list of regulated hazardous materials at the federal level “since it is a weak, non-reactive formulation that does not exhibit the reactivity characteristic” (Managing Pharmaceutical Waste, 2008, p. 18). For an environmental manager to learn and make the changes necessary to eliminate the use of one hazardous material, they will need to know and successfully address the chemistry, regulatory minutia, economics, and the organizational politics of the hospital.

Managers often work with contradictory and confusing regulatory requirements, and then market the implementation of some kind of compliance plan to other highly qualified professional staff who may not want to be challenged or who may be resistant to change. In this case, the environmental manager needs to incorporate both the reductionist, short-term mindset of a technologist with the big-picture, long term view of an ecologist (Petak, 1980). Petak (1980) said “...the environmental manager will be proposed as the organizational leader who must manage the conflicts that inevitably arise from differing philosophies, and facilitate integration and implementation of environmental policies, plans and programs” (p.288).

In his evaluation of the beginnings of American community psychology, Sarason (1988) noted that a new field must have a core of theory and be based within a larger context of another field, such as management. If these qualities are absent, then it should not be granted status or resources (Sarason, 1988). Does environmental management meet Sarason's requirement of having its own core of theory? Garlauskas (1975) did not consider environmental management a field within itself, based on its historical development. He noted four evolutionary phases of environmental management. In the first phase, during the 1950s and 60s, both the general public and the government became concerned about environmental problems. In the second phase, the environment was broken into media – air, water, and land - and regulated. Water and air pollution were controlled by regulation. Control of pollution of each media was the means of management. The third phase began to look more comprehensively at planning, and the fourth phase began in the 1970s and sought to reverse the environmental damage (Garlauskas, 1975).

The twenty first century work of McDonough and Braungart (2002) and Pierce and Jameton (2004) built upon Garlauskas' evolutionary phases of environmental management. Environmental management is evolving to incorporate the phase of redesigning systems to prevent pollution from occurring at all. McDonough and Braungart called for “industrial re-evolution” (p.154) a change in context that required that humans mimic natural systems, that give back as much as they take, providing a balance. Pierce and Jameton (2004) examined the ethics of healthcare's huge negative environmental footprint and called for elimination of the harmful environmental consequences of providing American healthcare. Pierce and Jameton's (2004) concept, called the “Green Health Center” (p. 61), addressed the social and environmental components of providing sustainable healthcare. It is the collective work of

theory that led Garlauskas to create his evolutionary phases, and those theories that built on the foundation work that will bring environmental management into its own as a field of inquiry.

CHAPTER FOUR: FINDINGS

Introduction

Hospital environmental managers engage in a process to learn, maintain their skills and make innovation happen in their facility. In the study, managers talked about their learning needs, obstacles, and barriers. In some cases, they discussed how some managers brought all of the aspects of their job together to create innovation. The data were derived from ten interviews and consisted of the qualities of readiness needed for the managers to *learn the job*; their acquisition of skills and navigation in the organization to learn and *maintain their skill*; and the evolution of skill into *innovation*.

Transcripts were coded and grouped into code families, which created abstract interpretations of the managers' description of their learning experience. The findings discussed in this chapter arise directly from the interview transcripts. The interviews provided data to learn how managers make sense of their experience. A learning process model was created to explain what the managers experienced as they learned their jobs and practiced environmental management in their facility. The model groups the managers' experience into three phases, which roughly correspond with the three research questions. The findings are a beginning to explaining the manager's experience. The data are the managers' stories of how they learn.

The managers represented a wide variety of backgrounds, formal education, informal experience and individual perspective. They lived and worked throughout the state of New Hampshire, mostly in rural areas. Many had attended at least two years of college and had developed other professional skills before moving, or being moved, into this work. There are only 26 hospitals in New Hampshire: with one manager per facility, the managers are easily

identifiable, therefore limiting further demographic profiling in order to protect their anonymity.

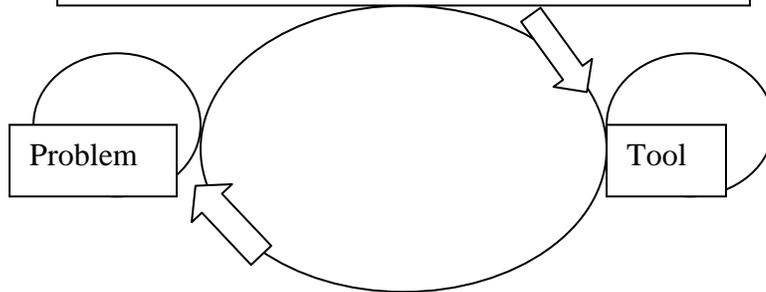
A Learning Process Model

Hospital environmental managers enter a process of learning by first being ready to learn, then by acquiring knowledge and resources. Some managers eventually learn to innovate by incorporating new strategies and taking on leadership roles in their practice. Based on responses, individual codes were created, which were later grouped into code families and larger code groups. For the ten interviews, there were a total of 835 individual coded data segments within 103 codes. The codes that were most frequently cited in the interviews were related to cognitive skills, control, and barriers in the learning process. These three code families represented more than half of all individual responses (434 out of 835 responses). Each code group will be addressed in describing the process of learning, as described by the managers themselves. The coding process uncovered descriptions of behaviors, attitudes, and perceptions that would seem to have acted as inhibitors to forward momentum in learning.

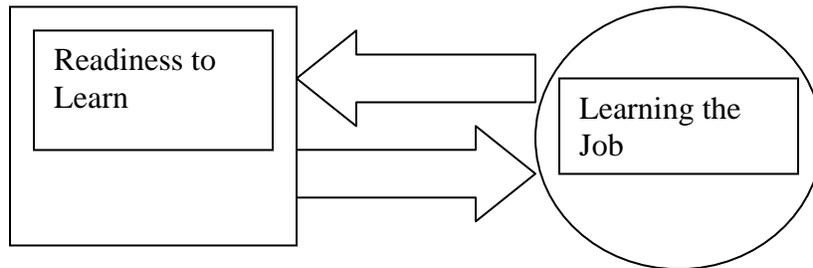
The model incorporates three stages of learning for hospital environmental managers. Each stage has a readiness prerequisite that, when met, allows the manager to continue in the learning process. The first two stages reflect single loop learning skills, where the manager works through a problem by learning to acquire and understand a tool, then puts it into practice to solve a problem. A tool could be a reference book, a regulation, a procedure (written or unwritten), or other resources. Managers reported attributes as positive aspects in their learning experience, and threats and obstacles as parts of their experience that stopped or hindered their learning.

Figure 1.
Learning Process Model
Stage I: Learning the Job

Single Loop (Compliance): A tool is found to solve a problem, without the manager questioning the underlying issues of the problem, which is only addressed for the short term.



As in single loop learning, the initial learning of a job is based on access and obstacles that the manager must learn to navigate: the problems are still there, but at least one tool is found to address the problem temporarily. A problem may be solved but learning is limited.



Attributes:
Motivation
Self awareness
Initiative
Problem Solver
Resourceful

Threats and Obstacles:
Ridicule and Fear
Restricted access to training/networking
Firefighting mentality

The First Stage: Single Loop Learning

The path that a learner follows in this model was loosely followed by managers. A manager may have mastered the skills necessary to accomplish the job within the hospital but have no knowledge of how to branch out to a larger community of practice and effectively network with other hospital environmental managers. The managers may be an accomplished learner within the scope of their facility but needs to learn about the larger potential scale of their practice. In this stage, (see Fig. 1) the manager learns the work of compliance.

Managers reported that in order to be ready to learn, they needed to bring certain experiences to the job. Their informal experience, a sense of control, and perspective were all listed as important in preparing them as learners. Adversely, when not present, responses such as despondency, a sense of oppression and frustration were present, which hindered or prevented their ability to learn the job. These attributes became code families, and the code descriptions are listed in Table 1. Out of forty one codes, only five were attributes, or positive aspects of the managers' learning experience, and the remaining thirty six were threats and obstacles to learning. This may represent one reason that some managers are not learning from the start. Self reported challenges to learning do not provide evidence of a correlation to compliance, although it is suspected and should be investigated further.

Informal Experience

Managers often noted that the informal experience, the life experiences that they carried into all new situations, was not useful in preparing them for being ready to learn the work of compliance. This was reflected by a code called *Skill Recognized but not the*

<p>Table 2. Readiness to Learn Code Descriptions: Informal Experience, Perspective and Control</p>
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INFORMAL EXPERIENCE

Threats

Making change happen is very difficult
 Comparing self to others
 Skill recognized but not the one needed for the task
 I really need help
 Education is piecemeal
 Averse to risk
 Motives for education
 Gaining awareness of educational needs
 Difficulty with learning technical information
 Regret of lack of education
 Needs a checklist/primer of how to do the job
 Computer help is not helping
 Comparing past experience with present needs

Attributes

none

PERSPECTIVE

Threats

People don't want to work with me
 Job is serious
 Averse to risk

Attributes

Wanting to "get it right"
 Pride in work
 Sense of justice
 of self evolving

CONTROL

Threats

Being isolated by peers
 Thin veil of ridicule/insults
 Fear of entrapment
 Lack of confidence
 hurts ability to get work done
 EPA is scary
 ability to work with others
 Problem driven responses
 Sense of oppression
 Acceptance of the job as it is
 Sense of inadequacy
 Sense of abuse of power
 Awareness of vulnerability
 Being constantly frustrated
 Angered at being
 manipulated by fear
 Change is happening, and it
 is not good
 Hospitals are small
 and dependent but do not
 want to be
 EPA should take the lead in
 helping us
 Sense of powerlessness
 Regulators work by
 frightening people
 Enforcement is a necessary Sense
 tool in learning
 Hard to work when threatened

Attributes

Taking initiative

One Needed For the Task . While several participants noted that they did have useful experiences in the past, they recognized that previous informal experience did not translate into the skill sets that they thought that they might need. Their inability or resistance to learning what was necessary for the work was reported in codes such as *Gaining Awareness of Educational Needs, Difficulty With Learning Technical Information, Needs a Checklist/Primer of How to Do the Job and Education is Piecemeal*. One manager was given the responsibility without any background of what the job entailed:

I wish there was a checklist. So I could down it and check things that you are responsible for, because I was left in a position where I didn't get files and records of previous work. We really had to come up to speed with a lot people in a hospital [who] say that "this is your job," so you start digging and digging more. It's hard.
(Wayne, 2007)

The majority of managers was in the latter part of their careers and described themselves as fearful or disliking computers as learning tools. At this stage, many wanted guidance and direct supervision of their learning. They wanted to be told what to do, especially as it related to technical or computer accessed information. They described computers as tools that were necessary, but that changed too often for them to master.

Control

As learners, hospital environmental managers accessed skills from previous experience and sought control of themselves and/or the work environment. They also gained perspective, to varying degrees, of their learning experience. The group of codes that labeled *Control* for this first stage was the largest issue that managers were grappling with as they learned their jobs. There was only one positive attribute within the *Control* code: *taking*

initiative. Control was generally perceived as something that was missing in the work experience. Many stated that their work was all about *Problem-driven Responses*, and that the job was a constant effort to address, but not prevent, problems. The interviews also reflected the frustration of never being able to get oneself above the endless management of crises and of not allowing the manager's time to reflect or learn. Without the ability to get beyond daily crisis management, it is reinforced as normative behavior. The manager cannot move forward.

Some managers were up to the challenge to master their jobs, as evidence by their response of *Taking Initiative*, where the managers described themselves as perhaps not knowing exactly what they had to accomplish, but were generally optimistic about jumping in and getting to work to learn the task. "That's the kind of person I am. I want to do that jump in and we'll make it work." (Beth, 2007) These managers were ready to move ahead and learn what needed to be done. They felt that they had some power over the situation. In fact, they had surplus power, as described by McClusky (1970). Because they had some sense of personal power, they were able to overcome uncertainty and move forward. McClusky described how surplus power, also called 'margin' (p. 82) is available to meet the demands of 'load' (p. 82) or the "demands made on a person by self and society," (McClusky, 1970). Having a sense of personal power prevents a person from becoming overwhelmed by their circumstances. Being overwhelmed prevents learners from being able to absorb new information. Personal power empowers learners to take on more demands.

Most of the responses under the code family *Control* dwelled on the lack of control that the managers felt, which inhibited their readiness as learners. Most managers experienced this as a lack of control. Managers reported *Frustration, Vulnerability, Being*

Overwhelmed, Feeling Inadequate and Feeling Isolated as having a negative impact on their ability to learn. These feelings fed a sense of powerlessness and lack of control, which is the opposite of personal power that some managers experienced. *Fear of Enforcement Actions, Entrapment, Ridicule or a Sense of Abuse of Power* also contributed to a lack of control. Fear can immobilize a learner: in this case a manager, who became too afraid to ask for help.

....everyone is afraid of the EPA. You're afraid to call, even with the state, you are afraid to call, you're afraid to reach out too much because you are afraid to turn yourself in, they'll show up at your doorstep and you are going to walk away with a huge fine and be unemployed on Monday. You hear these horror stories when you go to these meetings because they show you all the fines that you could get. (Tina, 2007)

An environmental regulator reported that hospitals were afraid of the EPA during one of the interviews. This person felt that fear was not only appropriate but was a necessary component to changing environmental behavior in hospitals. "...we'll [the EPA] get them [compliance documents that hospitals must file] in before we do the enforcement, but we'll probably then do a little bit of enforcement and then use that to try and get the rest of the universe [remaining regulated hospitals in the Region I area] in"(Wayne, 2007). The perspective that the EPA works by frightening people into compliance seems to be reflected by both the regulators and the regulated parties.

One manager said that

...I would appreciate it not to have that fear factor over your head all of the time and not to be afraid to utilize them as a service rather than a police kind of thing. There are a lot of times that I wished, doing what I do, I could call somebody and just not be afraid to just ask a question, and ask just a question about a process (Ivan, 2007).

Fear impedes managers' abilities to learn Fear makes managers reluctant to get information from the EPA. One manager described how fear of the EPA affected a larger audience:

That's one thing, when the EPA gets involved. It's okay if they scare you, but it's really tough with the ripple effect as it goes through your facility, scaring other people. When you want to make this right, there's no support (Ivan, 2007).

As distrustful of regulators as these managers seemed to be, there were two interviews where the managers still wanted the EPA to take a leadership role in helping hospitals. This same manager describes the frustration of having to bridge his operations with regulatory requirements, and of not getting assistance from the EPA:

We have dribs and drabs about what is considered waste. Lavage? [using epinephrine, which is synthetic adrenalin, used in many surgical procedures, and considered by the EPA to be hazardous] When you dribble it on a face it's not hazardous, [but] in a syringe it is? Holy...I really think they could take the lead on helping us (Ivan, 2007).

When managers experienced fear and distrust from regulators and peers, they described a sense of *Powerlessness*. Power of association is how people move through powerlessness, and Hagberg (2003) noted that until people gain a sense of power in some aspect of their lives, they will remain dependent, both cognitively and emotionally. The managers who noted powerlessness as aspects of their lives also noted isolation by peers. These people may have had a higher probability of not being ready to learn if these feelings of powerlessness were impacting their personal lives as well as their work lives. McClusky (1970) noted that isolation in one's personal or professional life can inhibit one's ability to take on new experiences such as learning.

Ridicule was another way that managers were stripped of power. “Our CFO jokingly said, ‘Your budget? What revenue do you generate from this large budget that you just presented?’ And I know he’s kidding but...”(Ivan, 2007). Staff that do not generate revenue do not have status in many hospitals. Some managers reported that this lower status derived from not providing patient care, and it makes them an easy target for ridicule and competition for resources, especially at budget time. This is an example of what Lewin (1948) called a negative interdependence, where learning will fail because trust is destroyed. Trust is eroded by ridicule, and group experiences such as learning become competitive and not cooperative. Environmental managers are often dependent on the willingness of peers to learn their own job. The managers’ peers are not usually in a reciprocal position. Peers such as pharmacy managers have a more focused knowledge of their own operations and are less dependent on sharing knowledge with others not associated with their area of responsibility. Lewin’s 1948 study of Jewish culture shows that, in some minority groups, those who succeed professionally within the organization are still marginalized and are perceived to desire to exercise what power that they have in their belief that their cause is superior to others in the organization. The managers strongly communicated a sense of frustration over a lack of respect for their contribution to the organization.

Patient care and its subsequent revenue generation are the most powerful functions in a hospital, and the work of environmental managers may be perceived as a nice but generally unnecessary job, ridiculed through thinly veiled jokes by peers and superiors. Because the work of environmental managers is so strongly linked to the work of others—for example, all of the waste generated by staff in the hospital has a direct impact on the manager’s job—the managers *are* highly dependent on other professional staff. Physicians are dependent upon

the staff that cleans, keep the lights on, provide meals, and the many other support tasks which are necessary to accommodate patients. Without interdependence, managers can be participant to both competition and ridicule because they not considered part of the group. Lewin's work (1948) demonstrated that individuals whose very future was completely dependent on a common goal shared by the group were the most successful at survival. In organizations, the success of a common task is a weaker form of interdependence. Lewin explained that when members of a group are dependent on a group for their success, the whole group is far more likely to achieve success. The shared goal of a group, can be manifested positively (cooperation) or negatively (competition) (Deutsch, 1973). When translated into a hospital setting, if learning how to manage the environmental programs of a hospital benefits and contributes to the success of the entire management group, the manager is likely to be more successful at accomplishing the task. Their reports of a *Lack of Confidence Hurts Ability to Work with Others and Hard to Work When Threatened* also indicated that some managers were really struggling with their peer relationships.

Perspective

While struggling with their peer relationships, managers also reported that they felt *Invisible*. One manager claimed that, despite the ridicule that he was participant to, he knew what he was doing was important and that it mattered. Managers reported that a sense of self was very important in grounding them and keeping them going during rough times.

Attributes within this code family, *Wanting to Do it/Get it Right*, *Sense of Justice*, and *Pride in Work* were important in keeping them on track and ready and willing to learn.

People Don't Want to Work with Me, *Job is Serious*, and *Risk Aversion* were the only code descriptions of threats to the manager's readiness to learn, and these perceptions kept

managers in a dependent stage where they did not manage successfully and needed to be directed.

After the managers initially learned the job, they began to redefine the job itself. Environmental management has no industry standards addressing what *environment* is being managed. Each manager can use this void as an opportunity or experience the lack of standards as a serious and ongoing challenge. The managers began to use a variation of single loop learning, as they branched out and began to use different tools, assess those tools, and adapt them to solve the same problem set. This second stage is called *single loop innovation*. This stage incorporates best management practices at a small scale to begin to solve the problems inherent in compliance. For example, if a manager is able to replace a hazardous material with a non hazardous material, then perhaps she can make it easier to comply with federal environmental regulations, in addition to improving safety. They begin to understand the concepts behind the regulations, the complexity of actually meeting the requirements, and the benefits and consequences of compliance. This manager is appreciative of what he knows, and how important it is for him to learn even more.

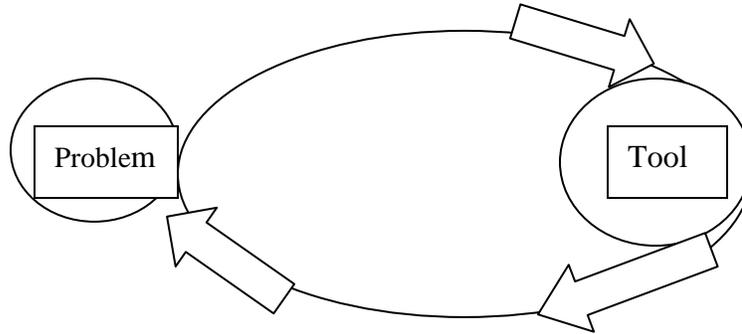
At that time, I realized that I needed to know more about RCRA. ‘Cause the more you learn about this stuff, the more you know that it is a very serious business, and there are very serious repercussions if you don’t do it properly. With the environment as well as the EPA. So it’s kind of like, if you do it right, it’s a win-win, and if you don’t do it right, it’s not a win.... And it wasn’t easy, the thing that I found hard with the whole thing was not having a chemical background... trying to learn and know about chemical characteristics... (Ivan, 2007)

Stage Two: Single Loop Innovation and Skill Maintenance

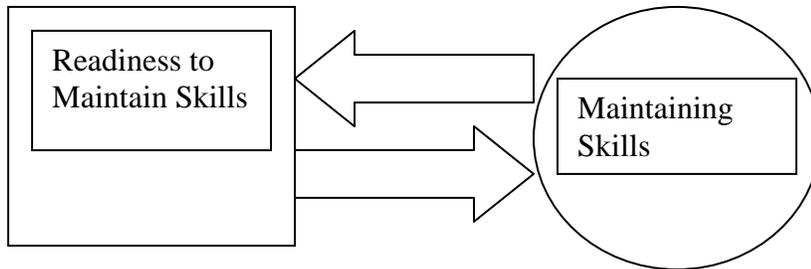
In Stage Two, the pace is fast and furious. Managers are able to address the obstacles and threats, gain confidence in their abilities, and can begin to take an active part in their learning. The manager begins to be a consumer of tools, can assess their value and assert them more effectively. They can use multiple tools. The tool, however, is just a tool for getting a job completed, a task done, a skill learned. The mastery of attaining skills further supports and encourages a readiness to learn more, and become more independent and responsible for one's progress in learning. Those managers who gain confidence in their learning are also confident to reach out to their peers and superiors and find that support is reciprocal. The attributes in this stage include that the manager finds support from their administrators. Those managers who do not gain confidence in their learning find that they feel isolated and rushed by the demanding pace. Another finding that some managers reported was that their autonomy was questioned if they were falling behind or not able to keep up, and this was very threatening to them, leading to further isolation. When they were confident, they could interact with their peers and administrators, thus earning them respect from both. When they failed to learn their work, they reported that they were participant to ridicule. In this stage, the learning process is represented by a higher number of attributes, especially related around the work of acquiring new skills. Threats persist in the Barriers and Pace codes, where time and working with other people provide new challenges to learning. Out of 44 codes, 21 are listed as attributes, while the remaining 23 are threats.

Figure 2.
 Learning Process Model
 Stage II: Maintaining the Skills

Single Loop Innovation: Tools are more easily accessed, and are now evaluated and adapts the tools to fit the same problem set.



Single loop innovation adapts best management practices and other tools at a small scale to solve problems.



Attributes:
 Access to Innovation
 Information: examples,
 case studies
 Time to maintain skills
 Funding/Administrative
 Support

Threats and Obstacles:
 Isolation
 Autonomy Challenged
 Pace
 Ability to Absorb
 Multiple Disciplines

Cognitive Skills

Environmental managers may find themselves in a job that often has little definition, few standards of performance outside of environmental regulation, and no predecessor who can teach them or offer advice. All of the managers in this study were the first ones to hold this job in their hospital. They were essentially starting from scratch. This is suspected to be the case at other small rural hospitals, but as there is no tracking of either the job description or the managers who fill the position, it is impossible in New Hampshire to quantify the demographics.

How did they acquire their skills and maintain them? Within the code family Cognitive Skills, the four most frequently listed aspects of learning noted by the managers were *Assessing Needs and Finding Areas for Improvement*, *Building Partnerships and Networks*, *Delegating to get Work Done (internally)*, and *Making Connections Between Actions and Consequences*. Managers reported that at this stage of learning they spent a lot of time walking around and comparing what they knew needed to happen with what was actually happening. One manager reported that observing was extremely helpful in learning her work:

...I spent my first six months for the most part observing. Certainly there were some things, like in the lab, that were just “No, we can’t do it this way,” But the first time I bit my tongue and the next day I went back and said “This is what we need to do,” I didn’t go in and say BLAH BLAH BLAH, I observed. And asked a lot of questions (Beth, 2007).

Table 3.
Maintaining Skills Code Descriptions:
Cognitive Skills, Pace, Barriers, Uncertainty and Practice

COGNITIVE SKILLS

Attributes

How to navigate as an individual in an organization
Building partnerships and networks
Critical thinking/synthesizing skills might help
in determining relevance of information
Translation/interpretation is part of this job
I learn/apply new ideas from my colleagues
Delegating to get things done (internally)
Hiring help to get the job done
Need to collaborate to succeed
I can access resources
Importance of documenting what we know/do
Talking to others is better than reading
Making connections between actions and consequences
Conferences/professional memberships keep up
knowledge
Assessing needs, finding areas for improvement

BARRIERS

Threats

Invisible aspect of job
infrastructure
There is a gap between available help and need
Expectations (external) are not being met
We only react in crisis management
Employees don't understand, won't change
Outside experts have more credibility than I
Deadwood employees sabotage change
We can't afford quality help
Trust: attaining, maintaining
Fear of negative publicity
I can't get the information I need to do my job
Funding constraints

Attributes

Supported by management

PACE

Threats

Needing to move fast
Time constraints
Unrelenting pace affects
my ability to
prioritize work

PRACTICE

Attributes

Importance of mentors
Autonomy is important to
succeed
Transparency is important
Respect from peers is critical my
to success
Value of long term
relationships
I am valued in my
organization

UNCERTAINTY

Threats

Weight of many Dysfunctional
responsibilities
Compliance is a constant
worry
Compliance is a moving
target
Questioning status quo
Regulations don't fit our
work
Definitions/scope/jargon
lacks consensus
and clarity
Learning to maneuver
complexity

She kept a running list of things that she didn't know enough about, needed to update, or of skills she needed to acquire to accomplish something. Harry also found alternative problem solving strategies:

It was the medical waste aspect of my work with which I had zero familiarity...So, that aspect of my work I learned about ... that I began working with immediately upon arriving, through reading the state reg's, through doing the work, actually having to figure out what am I gonna do with this little problem (Harry, 2007).

One of the biggest challenges that environmental managers faced when they began their job was polite questioning from peers about why the hospital needed a specialist to handle what was essentially thought to be a janitorial function. An anecdotal query of four non-hospital employees (one state regulatory, one federal regulatory and two persons who worked in non-profits that work with hospitals on environmental issues) indicated that there are two prevalent environmental management theories-in-use by people or assumptions about how the world works in hospitals. The first is that waste just goes away—the more cheaply and faster, the better. These individuals do not recognize the need for professional management until an incident occurs that alerts a facility and forces staff to recognize their legal obligation to environmental management as it relates to their own activities. All of the managers in this study recognized this as faulty reasoning, but commented that the theory-in-use remains valid for many of their co-workers. The lack of recognition of the need for professional management may be directly related to the lack of investment in the training and education for those persons responsible at a management level.

The second theory-in-use is particularly problematic for managers: it is the perception that chemicals used to treat people therapeutically must be useful and helpful in general. They are not perceived to be hazardous, despite the fact that they are listed on federal environmental lists subject to regulation because of their hazardous characteristics, such as toxicity. Some chemicals that are therapeutic drugs for humans are hazardous when they are released into air, water or soil. For example, chemotherapy drugs can treat cancer: but as a waste stream, when disposed of incorrectly, many are persistent in the environment and toxic to wildlife.

The managers may not realize the potential consequences for the staff people who work with and may come into direct contact with hazardous materials which eventually require disposing of as hazardous waste. The managers may not recognize that while the materials are in use, even when kept as small quantities throughout the hospital (for example, mercury containing thermometers, alcohols and pesticides), these hazardous materials require a management plan that addresses the environmental, health and safety requirements mandated by state and federal law.

Argyris' (1993) Model II of his theories-in-use work calls for the integration of values in order to shift paradigms. Managers in this study made connections between the values of a healthy community and environment and argued that well people and a well environment were equally important, and that hospitals had a responsibility and opportunity to promote both simultaneously. As managers acquired their own skill sets, they could bridge partnerships within the hospital with those people who were supportive of these concepts, especially nurses, who have had a long tradition of understanding and promoting these connections. Managers could then begin to direct their learning and leading from a vision of

positive change, instead of reacting from fear. Beth, an environmental manager, described the impact of incorporating sustainability as a value into her work:

As we apply environmental sustainability efforts and initiatives within [hospital], you know, we're both innovating and just continuing to do our jobs better. I mean, I don't see them as neglectful of each other at all. It's all about lifelong learning and change. It's about doing better at what you do (Beth, 2007).

Managers noted that the acquisition of specific skills and learning how to be a member of a team and/or organization were important aspects of their learning experience. Individual skills included *I Can Access Resources*, the recognition that they accomplished the task of being able to find and acquire what they needed. Specific individual skills also included *Hiring Help to Get the Job Done*, and the communication skills of *Talking to Others is Better than Reading* and *Translation/Interpretation is Part of This Job* are also important aspects of both learning and doing this work. Talking with peers to navigate through complex issues and clarify jurisdictions and responsibilities is a large part of this manager's ability to learn her job:

A lot of our work is how to make things go away safely or appropriately and since they're [other staff members] in the same line of work and there's often a gray matter, so to speak, where it's not clearly going to be in my camp or theirs, we have to talk (Beth, 2007).

In addition to these cognitive skills, the managers also said that *Critical thinking/Synthesizing Skills Might Help in Determining Relevance of Information* was a key aspect of their learning process:

Synthesizing, I think, material is definitely a skill that is gonna help out someone like me or them in kind of digging through a high volume of material to get the one piece that's gonna give them what they need right then and there (Sam, 2007).

Pace

While managers acquired resources and relationships, several issues created obstacles for them, including *Pace*, a code family that had only three codes that were all threats to learning: *A Need to Move Fast, Time Constraints, and Unrelenting Pace Affects My Ability to Prioritize Work*.

These threats limited the managers' ability to take in more information, and to make sense of the information that they already held.

The three code descriptions are all reflected in this manager's frustration:

So, how do you learn this job? Boy, there's so—there's such a huge opportunity.

It's more figuring out what you have time to read. Because it is coming at you faster than you read it, absorb it, feel like you could actually put together a program like that. I mean, and so if you're on the ground, you have to really put the information that's coming at you into the right channels and just file it, because you're focusing on this particular project at a time. Because it's overwhelming (Wayne, 2007).

These managers are working during the information age in a service industry, and their success is based on how well and fast that they can learn and maintain their skills. Half of all employees' skills are out of date in three to five years (Shank & Sitze, 2004), and in high tech industries, computer technology turns over every eighteen months (Desimone, Werner, & Harris, 2002). To thrive in this environment, organizations need to nurture learning skills as a collective effort

Barriers

While *Pace* created obstacles to learning, there were many other barriers listed by the managers. Thirteen were listed as threats, with only one, *Supported by Management*, a lone attribute. As the managers attained and sought to maintain their skills base, they needed support from administrators for funding and time to attend conferences, as well as training for other staff to cover for their absences, to handle spills and other emergencies, and to take care of routine waste issues. Almost all training for this work was done off site and involved travel outside of New Hampshire, often requiring overnight travel, meals, and other expenses. The training, such as the annual training required under the Resource Recovery and Conservation Act (RCRA), is expensive and requires refresher courses each year. Managers reported that *Funding Constraints* are prevalent throughout their organizations. “You know, the larger ones are in the black in this state, all but one. The community hospitals are in the red, but maybe one. So they have challenges in front of them fiscally...” (Charlie, 2007)

While funding was consistently cited as a problem, other forms of management support, a key element in the learning process, was generally as positive. One manager found support as he moved forward despite a limited budget:

I haven't had any push-back from them [administrators], I haven't spent anything outrageous, and I haven't had any push-back as far as ‘This is what we need to do.’ Pretty much any time I have come to them and said ‘Okay, we're ready for this,’ they'll say, ‘Okay, that sounds reasonable. How are we going to do it?’ I have found a ton of support here (Sam, 2007).

Many managers reported that they received support from their administrators, but they also reflected on the lack of support from co-workers who did not want change to occur. A manager who worked against ingrained habits from long term employees said,

The hardest thing is to try and break bad habits. You come in and you are new and you want to make the codes, and everyone else has been doing it this way for so long. It's very, very difficult for them to change the way that they have been doing business for ten, fifteen, twenty years. That's one of the hardest hurdles that I am still trying to get over. People do not like change (Wayne, 2007).

Other barriers included issues of relevance, where managers felt that the job that they did was sometimes considered unnecessary or not central to the mission of the hospital. Several managers said that *Outside Experts have More Credibility than I do*, as they were trying to establish themselves as knowledgeable and trustworthy.

Uncertainty

Managers struggled with *Uncertainty*, which could limit opportunities to learn. Within the code family of *Uncertainty*, there were seven codes, all defined as threats. When uncertainty is perceived as a threat (and not an opportunity), resistance and stress are experienced. In their discussion of stress and cognition, Beehr and Bhagat (1985) list three characteristics of stress, all of which are present for hospital environmental managers: ambiguity, overload, and underutilizations of skills. These stressors can arise from the environment or from internal expectations. The managers listed both internal and external expectations as contributors to uncertainty. Compliance was described as a moving target and a constant worry, and the managers' frustration of being responsible for learning and knowing all of the information necessary to do their job was clearly exacerbated by (their

description of the code) *Definitions/Scope/Jargon Lacks Consensus and Clarity*. Demands can be ambiguous and made worse by the lack of standards and metrics to assess performance. And the managers, like this one, are right in the middle of the challenge:

And I am supposedly expert, and I tell him how to label things. [my subordinate] does the monthly and weekly checks, and I'll do an audit every now and then to make sure that he is labeling correctly. Do I feel like I am an expert? By no means, it's a moving target, but that's how we are doing it now (Ivan, 2007).

Learning to Maneuver through Complexity also introduces a great deal of uncertainty into the learning process for hospital environmental managers. Managing under ill-defined conditions is described by this manager:

It's hard to come by [answers to questions] in hazardous waste management compliance issues. I was referring to the complexity of RCRA earlier and that's related to this. It's really hard to get a black and white answer to some of the nuanced questions that people who have to manage, for example, hazardous pharmaceutical waste, the questions that those folks will come up with (Wayne, 2007).

Two other forms of uncertainty were reported. The first is the general uneasiness of what C. Wright Mills (2000) described as an anxiety, a "deadly, unspecified malaise," (p. 11) caused by a threat to one's well being. When an individual holds a set of values and finds them threatened, that individual becomes anxious. If all their values are threatened, then the person can become panicked. In describing his situation, Wayne became agitated, but not panicked. The values shared by many managers were self-sufficiency, being a part of something larger than themselves [taking care of the sick], and taking care of the environment. Some of the managers felt that when these

values were challenged, they were less trusting of their superiors or co-workers. Lack of trust can create more uncertainty. It is difficult to learn if you do not know who to trust. Trusting creates a willingness to cooperate and seek common goals: a lack of trust creates competition. The establishment of trust is discussed in the third stage of the Learning Process Model, but at this stage, it is the lack of trust that inhibits learning. Berwick (2005), a physician, described mistrust in healthcare organizations:

Poor quality in healthcare is not like poor quality in cars. Rather, like air and water pollution, we all share in the harm healthcare can do. We cannot “compete” to clean our healthcare system. Pollution cannot be removed by creating a perfect market, but only when we rediscover our social conscience. Until we decide as a nation that the enemy is disease, not each other, we will fail (p. 32).

Practice

The last element of single loop innovation involves the development of practice. As managers began to overcome obstacles, to establish trust with peers, and to find reliable means of maintaining their knowledge base, they began to develop a practice. They were becoming self directed learners, responsible for the quantity, quality and pace of their work. A practice incorporated individual learning with that of others who share similar professional interests. Since hospital environmental managers were sole practitioners in small rural hospitals, they need to expand their horizons by developing relationships with mentors and peers outside of their workplace. Managers reported that the value of long-term relationships, respect, transparency, and autonomy were all factors in the successful creation of a practice.

The *Mentor* relationship generally occurs within the context of a shared organizational environment, but in the case of these managers, the mentor relationship occurred outside of the hospital setting. While it took additional energy to maintain, the managers reported that the experience of mentorship was extremely valuable to their career development and helped them deflect frustration by giving them a sounding board in another person who could not only understand the work but who could make suggestions to improve the situation. Three managers reported having a mentor at some point in their career: two of them described a mentoring relationship during their present job. Those two, however, described this relationship as very important. Levinson (1978) noted that mentoring is not successful in environments that are highly competitive, “bottom-line” climates, where nurturing is not valued by an organization, or where individuals are too caught up in their own lives to extend nurturing to others. Managers described their work environments as being cooperative until resources are needed; then their work environments can become very competitive. For mentoring relationships to succeed, Kram (1988) said that they must be mutually beneficial. This agrees with the limited data that were collected in this study. Mentoring can be destructive, especially when the relationship is forced, or when the mentor is also a superior. As managers began to establish their own practices, they especially noted that a mentor outside of the workplace helped or was helping them to gain perspective on their work. Only one of the managers reported ever having had a mentoring relationship with another person in their current work place. Kram explained that other career functions served by mentoring, such as sponsorship, exposure and visibility, protection and challenging assignments are not aspects of mentoring that an outside mentor can usually offer to a colleague. Mentors can help managers to avoid

pitfalls and challenges that they themselves had already encountered, thus managers can benefit from the mentors' own experiences. Mentors can also encourage distinct methods or ways of learning new skills. Kram also listed the psychosocial functions of mentors such as role modeling, acceptance and confirmation, and friendship, all of which an outside mentor can still provide to a colleague. This was confirmed by the two managers who noted mentors as important influences in their work lives.

In their role as confirmers, mentors provided reality checks when important decisions need to be made. Wayne, an environmental manager in a hospital said:

...there are a couple of folks who I can go to saying this is my understanding of the advantages and disadvantages of each of the [specific technology] commercially available systems. And, I'll go through them – pros and cons of each one and just check my knowledge against theirs. And they say, "that's right" or "you might consider this," so I gain a lot of knowledge through them (Wayne, 2007).

One manager helped another colleague make a tough judgment call, when no other support was available within the organization:

... The hospital made the pharmacist sign a waiver that if they ever got inspected, it would not be Sarah's fault, because she had provided all the information, all the training, everything to do what was right and the pharmacist refused to do it. So she's like, "fine, I'm making you sign," and I remember her saying, "I made the CEO sign it too." She said, "I have provided everything to this guy. He refused to do any of the RCRA management, he's on his own. If a fine comes through, it's his fault." I was like, "good for you." (Wayne, 2007).

In this situation, while the manager acted as an informal mentor, and reminded the colleague of the obligations and values that they share—both moral and legal.

Respect from peers was also important in developing a successful practice. Managers noted that respect from their peers was critical to their success, and many managers reported that early in their learning process, they had not received respect. In hospitals, years of service are an important status symbol. Some of the managers in the study had worked at their hospitals for decades, but their responsibility for environmental management was relatively new. They were able to broker their service time as means of gaining credibility, despite the new nature of their responsibilities. Atchison (2005) stated that respect is a rare commodity in healthcare, and recognition of worth and value are in short supply. If a person isn't respected by their peers, then they have little credibility. If they have little credibility, they are less likely to garner resources in the work place. Earning respect was a key aspect of developing a successful practice: it demonstrated that the managers had mastered skills but also had proven themselves to be trustworthy. Beth describes how trust became established at her hospital:

I'm not part of the old boy network. No one in [my hospital] is. We're a different breed, but we have to interface with that cohort. And that has taken some real time to build relationships, but we've done that and I think the key to success for us in [my hospital] has been really been the relationship building. Those face meetings, those breakfasts, lunches, dinners, forming these relationships that are—I have a level of respect on both sides of the fence. We respect them [administrators], they respect us, but it's taken a while, but we're there (Beth, 2007).

Respect required *Transparency* in relationships. When the work environment was transparent, there was no place for people to be invisible. Everyone is valued and respected. And in Yuri's case, everyone was heard:

Our CEO said "It's my decision," but he will listen to your input. He will, it's not just a face. He'll truly see what you have to say. And the end of the day it's his decision, that's why he is the CEO, and for the most part, he makes intelligent decisions and considered decisions, as does our V-P [vice president], so we feel like we are being heard. It's a transparent system which is really nice. I have an open door with everybody. (Yuri, 2007)

Autonomy is the ability to be independent, make critical decisions, and be able to appreciate and utilize a relationship within a learning organization (Chene, 1983). Candy (1991) used the term self-direction to describe autonomy as the "personal attribute or characteristic... to learning situations" (p. 101) where thinking and learning were conducted in manner that required "self-determination" (p. 101). This gives them the grounding needed to make decisions, plan, and have the fortitude to last during difficult times. This makes for a strong independent learner. Candy (1991) also attributed willpower, self restraint, and discipline in seeing tasks to their completion as important parts of autonomy (Candy, 1991). Self-directed learners are grounded within a common organizational goal that provides a balance between an individual and organizational learning needs.

Earlier in the learning process, managers struggled with a lack of control: to determine their work and to access people and resources. To successfully create a practice, a manager must not only become a self-directed learner, but a manager must also have self-

control and be able to monitor their own progress. Self-management, motivation, and monitoring are the three elements of Garrison's (1997) interactive model of learning. His criticism of self directed learning extends to the self monitoring and motivation aspects which require accountability on the part of the learner. He believed that the ability of learners to not only reflect on the cognitive aspects of their learning, but to also understand, challenge and act upon how they think is not addressed enough in the literature of adult learning. In this study of hospital managers, almost all people stopped at various points in the interview process and commented that this was the first time that they had ever thought about how they learn and about their strengths and weaknesses as a learner.

Managers gained confidence as they developed their work. None of the hospital environmental managers actually used the term *practice* to describe this stage of their learning process. Those managers that had reached the point in their work that they felt established, credible, trustworthy, and trusted by their peers and superiors and able to garner the resources they needed to accomplish their work, described that they had reached a "good point" and a "good place" in their work. This confidence can carry them into the last stage of learning—called "double loop innovation."

The Third Stage: Double Loop Innovation

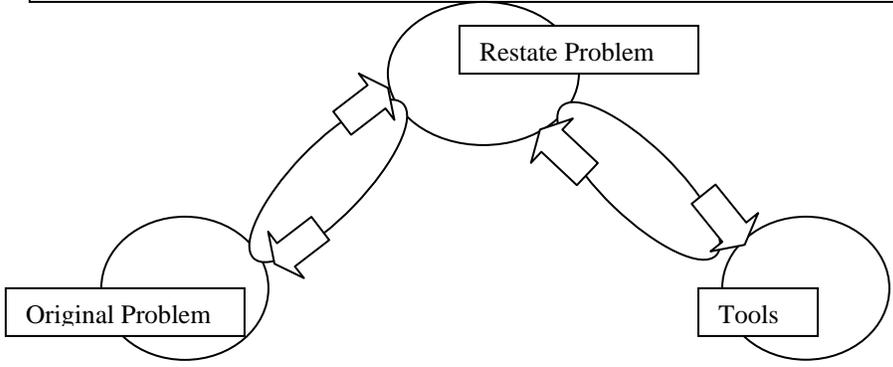
In the two earlier stages of learning, the managers struggled with figuring out what the work was and the process of acquiring skills and tools. They later defined the tools, assessed its value and usefulness, and learned how and when to use each tool or skill. In the last stage of learning, which two managers experienced, the learner became a teacher, gained a different perspective of the work itself by learning, and taught problem prevention. They also framed their work and learning from a very different place. For example, instead of answering

questions they asked the questions. Instead of solely reacting to external requirements, they asked proactive questions of where the hospital wants to be, and which direction the hospital wants to go. They gained the perspectives to reframe the questions and bring vision, mission and opportunity into play, thus creating an environment where change was more welcome than before. In essence they created openings for new communication and ideas. An example was that in the first stage, they were learning how to create a hazardous materials management program, and in the second stage, they were trying to reduce the volume of waste that was generated through better management practices. In the final learning stage, the managers questioned why hazardous materials have to be used in healthcare at all, and sought ways to change practice and eliminate the usage of hazardous materials through product substitution, while aligning mission to practice and communicating the importance of this to the larger community.

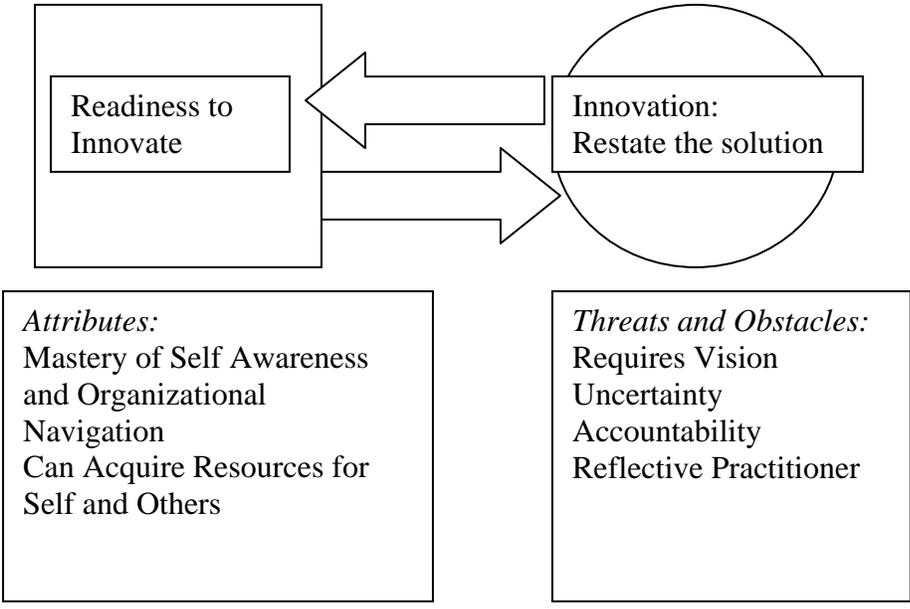
Within these three stages, most of the nine hospital environmental managers that I spoke with were still learning or maintaining their skills, but two managers described themselves as innovators. That I found two innovators indicated that there were managers who had figured out how to learn and to do environmental management in a field that is relatively new and undefined. Each code reflected a single element of work in a complex system. Each code described an abstraction, and the scale of the abstraction was not always the same. The third stage of learning reflected a change in the mindset of the manager and incorporated double loop learning. In this stage, managers learned how to restate problems, and then garner resources or tools to fix the problems.

Figure 3.
Learning Process Model
Stage III: Innovation

Double Loop Innovation: Managers now question the assumptions behind problems, learn to reframe it, and then find solutions on a systematic and more permanent manner.



Double loop innovation seeks way to eliminate problems by challenging the assumptions behind a problem. The underlying problem is restated by the manager.



The key element was that they were questioning the underlying values of the problem or question and incorporating intangible assets such as trust and synergy into their decision-making process. This stage is called “double loop innovation,” and it includes systematic, vision-driven change on a large scale. Instead of solely managing individual compliance issues, the manager reframed work and created systems that promoted healthy human and environmental systems.

In this final stage of learning, all of the codes were listed as attributes, see Table 4. While the managers were aware of potential obstacles, such as uncertainty and accountability, they felt as learners that they were capable of addressing them, and helping others to address them as well. The managers who described themselves as innovators had mastered the use of tools to solve problems, and had moved into a place where they were teachers as well as learners. The final stage of learning in this model is called double loop innovation, based on Argyris’ (1993) model of double loop learning. Argyris’ model described how a person can learn by restating a problem and redefining the solution, instead of just using the same tool over and over again to answer a question.

In double loop innovation, the second feedback loop also changes internal values (in this case, self preservation) by introducing the ability to critically examine the underlying theory of why things exist the way that they do. Theories-in-use—the manner in which we accept things as we experience them—were questioned and sometimes change . Argyris and Schon (1996) stated that questioning of how things exist begins with self-awareness. Their description helps describe the process that hospital environmental managers underwent as their skills matured and they learned to navigate the complexity of both the content and context of their work lives.

<p>Table 4. Innovation Code Descriptions: Leadership, Accountability, Vision, Catalyst, Reflective Practice, Scale</p>

LEADERSHIP

Taking risks to make change happen
 Providing leadership in organization

ACCOUNTABILITY

Sense of accountability
 Community service is our
 responsibility

VISION

Teaching the “why” as well as the “what”
 Creating and sustaining a vision
 Communal commitment to environmental
 health

CATALYST

Synergy/catalyst for change
 Advocating: becoming the mentor
 Discovering and sharing a new
 perspective

REFLECTIVE PRACTICE

Embracing the humanity of (within)
 Deep, quiet and sustained commitment
 To change
 Asking questions instead of telling people
 What to do

SCALE

Infusing a systems approach
 Super ordinate perspective

For example, a manager who has become comfortable working with specific environmental regulations challenged why the regulations are in place or why a hospital is participant to them. She asked herself if there is a way the hospital could go beyond compliance by changing practice—by innovating—to the extent that the facility no longer exceeds regulatory thresholds that require certain actions. She reframed the question and answered it, instead of just answering the same question over and over again. In answering the new question, she was able to make a change and to provide leadership and direction. Double loop learning required that the learner reflect and challenge the ways things have always been done, as well as address a particular issue. This level of change is predicated

on self awareness and experience. Those managers who had successful learning that translated into innovative change offered that they were able to transcend from experience to meaning. These managers successfully made meaning of their own situations and, as Kegan (1982, p.11) explained, "...the most fundamental thing that we do with what happens to us is to organize it." Harry, a hospital environmental manager, reflected on how he could make an impact and how this ability helped him to organize his work.

He created an innovation system to handle infectious waste bags,

What we're doing with the individual infectious waste bags is critical[ly] important work for me, but that's not what really floats my boat. It's this concept [that] we're truly changing the entire climate of our globe because of the ways that we've been doing things, so we've got to change how we're going to do those things. ...How do we go about that in a hospital? I find that the most interesting (Harry, 2007).

Double loop innovation as a strategy must be employed by persons who have established themselves as self-directed, confident learners. The managers who chose this strategy were shifting both the paradigms of their work as well as their position in the work. The work shifted from problem solving/fire fighting to creating sustainable systems. The managers changed their perspectives from managers to leaders.

The paradigm shifted from crisis management. While the managers once utilized single tools to solve problems, in double loop innovation, they worked within systems. When managers were just beginning to learn their work, they were dependent on simple direction and repetition. At the innovation stage, they received little or no direction, the pace required cognitive improvisation, and the environment was complex and global. Learners became teachers and mentors, and managers became leaders. There was a small

but significant difference in learning how and doing something correctly and knowing viscerally what was morally right and having the ability to act upon this knowledge. Perhaps, as in Yuri's situation, there was a personal obligation to do what was right despite the frustration of time constraints:

Why is it that I have to take on another project when the bills are getting paid, my staff is getting paid?...I don't have any incentive to do that, except it's the right thing to do and frankly, I know it's the right thing to do, but I'm just too damn busy to do the right thing (Yuri, 2007).

Innovation is a process based on relationships, where adaptive learning is done as a group within the organization. People cannot innovate alone: they must bring the learning forward to others. While this research focused on the individual manager's experience with innovation, there are certainly times when group dynamics are critical for an innovation to succeed. Innovation, as a process, occurs in a highly uncertain environment where trust is crucial, and the work is completed without the normative boundaries and requires a great deal of personal and professional maturity. The traditional means of gathering information may not work if they are based on past precedents (Van de Ven & Polley, 1992).

In the general population, approximately 2½ % are what Rogers (1995) has called innovators—people who are attracted to novelty and new ideas. In his model of innovation, Rogers defined innovation as “an idea, practice, or object that is perceived as new by an individual or other unit of adoption” (p. 12). Atchison and Bujak (2001) added that “their frame of reference is external to their peer group that generally cannot discern if the innovators are ingenious, crazy, or both” (p. 29). While two managers in the study self-

described themselves as innovators, they both expressed some hesitancy about using the term to describe themselves.. They wanted to be perceived as ingenious, but not as visionaries. They both valued their recognition of their part in the organization, and they disliked anything that seemed to draw them apart from whatever sense of belonging they had fought for and earned.

Both managers had extensive opportunities to learn (initially and as an ongoing process), enthusiastic organizational support, and a strong following of a wide variety of professional and non-professional staff. Yuri described the importance of working with his co-workers:

Some of the skill sets...I would actually say that part of my success, even in this job, has been my enthusiasm for the work. And, how that's infectious. So, when I talk to people about why to do it, it's kind of like, you know, this stuff is not impossible. You just have to convince people that, you know, you need to pool the resources out there to gain the benefits of doing the work, but because it's all doable and achievable, you know, telling the stories or sharing other people's case studies, I find pretty exciting (Yuri, 2007).

Yuri was using his learning to make positive and assertive change in his hospital, despite resource scarcity and many other factors. Other managers were putting their learning to work to create positive change and become role models for others. These managers attributed these qualities to their ability to create innovation. They described themselves as *Catalysts*, where they were able to be the one individual that changed the direction, energy or ideas of the group. They also felt comfortable in *Reflection* of their values and how their decision flowed from them. They were driven by these values and

described how this openness also helped others to embrace a collective *Vision* for change. From their articulation of shared values, they offered others something to choose to follow, to believe in, providing a *Leadership* of vision, not necessarily of a corporate structure. And finally, these managers openly demonstrated *Accountability* of themselves and others, and of sharing this with a broader community.

When managers reached this level of their learning process, they began to realize how much they had learned and how much they needed to teach and motivate others. They needed to act as catalysts to help people understand and appreciate why things need to change and the benefits of the changes, so that they could see the inherent values for themselves and others and decide that it is worthy of learning, knowing, and doing something differently in the future. Hagberg (2003) described the final stage of personal power as the letting go of ego and going into one's core. Thoughtful action requires that we do give thought to our actions, but from the content of our previous learning. Reflective action occurs after reflection has created insights that inform the decision-making process.

Trust

Trust needs to be present at the interpersonal and organizational level as well. Ivan described how he felt that he and his work were trusted at the higher level:

I believe in my institution, you know, we believe in sustainable healthcare by doing these things. It's basically the mission statement that we got through environmental leadership. The environmental principle statement, by adding a new change, sustainable buildings, you know, just adding a few more elements to make it more reflect what's happening now in 2007.... once they sign off on a statement of principles with action plans, they can go back to do their presidential work, but at

least the people who are then empowered to do the work—are empowered. It changes everything (Ivan, 2007).

Trust in the organization and the individuals that comprise it is a fundamental part of the ability to nurture innovation in environmental management in small hospitals. Berwick (2005) indicated that trust within and in the larger community around a hospital is generally extremely rare and very badly needed in healthcare, including environmental health and safety scandals.

Atchison (2005) cited trust as the most obvious problem in the healthcare industry today. He considered trust to be the key element in his leadership model. The foundation of 65% of an organizations' performance, along with pride, respect, and joy, Atchison considers trust to be the critically missing intangible that leaders need to earn from and have for others to succeed.

Accountability

Within credibility lies accountability, and many managers spoke to their sense of accountability and responsibility to their communities. The managers said that accountability was a means of learning, recognizing, and being constructively critical and vocal about the negative features of their organization.

One manager was beginning a process to report to his community about their efforts to reduce the hospital's environmental impact. While there were no commonly used units of measure for this kind of reporting - such as tons of material recycled - the effort showed a willingness to improve and an openness to communicate his belief that responsible environmental stewardship was important. Not only did this type of reporting hold the hospital accountable, but it also helped to institutionalize the environmental programs and

could sustain the programs, especially if the larger community as a whole sees value in them.

Despite the challenges of learning this kind of work, there were examples of other managers (not in the study), especially in urban areas, that were successfully moving ahead with major transformation in their facilities of everything from green chemistry (substituting non-hazardous materials for hazardous), energy efficiency, and local sourcing of food. Charlie saw that this fundamental change in how environmental management in small rural hospital was conducted was needed and possible.

There's going to be a different way of moving this market and transforming the goals that we have to a very successful place. We think we're gonna do this. We're gonna make this sector become environmentally responsible and become a shining light to other sectors that are out there. It's a tall order, no doubt. We still have a ways to go. Some people may say a long way. But we're seeing a transformation (Charlie, 2007).

Innovation

Two managers, with a third manager just beginning to become involved in innovation, were focused on doing innovative work. These early adopters also conveyed a quiet pride in their work and a desire to communicate what they had accomplished. They had a tremendous amount of administrative support and openness to new ideas from the very beginning of their jobs and enjoyed positive feedback from their peers. These three managers felt respected and valued as part of a team. Although they had to insert themselves into the decision making processes, they were not turned away when they asked for access; others listened to them.

What can the other managers learn from these innovators? Environmental management in hospitals requires individuals to learn technical skills in a social construct at a fast and relentless pace. Managers can possess brilliant technical skills, but if they lack people skills and are not aware of the values present in themselves and others, they will not learn or succeed in a hospital environmental management position. If they can learn content quickly but do not listen to others, they will not learn all that they need to know. If their communication does not respect the values of the hospital subcultures, they will be perceived as outsiders. And finally, without understanding their own learning style, needs, and weaknesses, they cannot improve, complement, or supplement their own experience to fully learn what they need to know to successfully manage environmental programs in a hospital. Like Ivan, they already know that it is an important task [reducing their negative impact on the environment by implementing programs that are based on excellence in environmental management] whose value is shared by others:

You know, just having a [name of office in hospital] with true environmentalists in it [who can] just kind of gently nudge everybody with whom they work about doing things slightly different, is, I think, a greatly effective way to approach it, rather than something splashy and PR oriented... the upper levels of this institution are really interested, deeply interested, in seeing us becoming more environmentally sustainable (Ivan, 2007).

CHAPTER FIVE: CULTURE AND COMPLIANCE

Introduction

This chapter examines the relationship between hospital culture and compliance, and explores how hospitals impact the hospital environmental managers' learning process. How the managers worked and learned in the hospital setting were described as well as their thoughts about why they might be struggling with compliance. Several sources were found about effective organizations and the connection between theory and practice. The variables that influenced learning, such as culture, compliance, and learning organizations were presents in the managers' descriptions but not the primary focus of the research. Since these variables were a constant presence in the managers' stories, culture and compliance are discussed in this section.

The relationship between culture, compliance, and learning as a collective effort can affect how managers continue to learn throughout their careers. If one of these elements is missing, its absence can cause a manager's efforts to become stymied or stopped. The impact of culture on the hospital environmental managers' ability to learn and maintain their skills and on their participation in organizational learning are two factors that influence compliance in small rural New Hampshire hospitals. The discussion of culture incorporates three levels: globally through the healthcare industry as a whole, regionally through the healthcare industry in the state of New Hampshire, and locally through the subcultures that exist internally in hospitals. These cultural influences have an indirect impact on the process of learning for an environmental manager. The discussion of compliance is organized by groupings called inspections, matrices, standards and learning.

The Healthcare Industry

The large number of people employed in the healthcare industry, the volume of waste generated, and a hospital's use of resources all create potential for a huge negative impact on the environment. There are 4.93 million paid employees in hospitals alone in the United States and 6.88 million in ambulatory and nursing care facilities, often associated with and physically located in a hospital (Anonymous, 2005). Hospital waste comprises one percent of all solid waste generated in the United States, which equals approximately 2 million tons every year (McRae, Shaner, & Bisson, 1993). American hospitals have been designed for "...unlimited inputs of energy and resources; this results in waste in the name of hygiene, insurance and regulatory considerations, and the 'best' care" (Bednarz & Bradford, 2008). Bednarz and Bradford state that hospitals use twice as much energy per square foot as office buildings (Bednarz & Bradford, 2008), and yet the future energy needs, capacity, and environmental impact of providing healthcare are not identified as a concern by administrators.

This potential for hospitals to have a negative impact on the environment creates some serious challenges, which are often passed on to the hospital environmental managers. Some hospital environmental managers clearly understand and are eloquent about the need to provide for the common good, with environmental care receiving equal priority with patient care

Another challenge in the industry that affects environmental managers is that the work of environmental management does not generate revenue and is considered an "overhead" expense, participant to budget cuts, regardless of its true cost. Revenue generation asserts a strong influence on the culture in a hospital, especially in those hospitals

operating with severely restricted funding. Those hospital departments that have the capacity to generate revenue gain status by providing goods or services that can be reimbursed by the patient, third party insurance, or the federal government on behalf of patients with Medicare, Medicaid or other financial support. Those that do not generate revenue can be perceived as extra, less important—an outsider or invisible. Even hospital administrators who generally make supportive statements and take supportive actions chastise environmental managers for not generating revenue in their budgets. One manager described an early attempt to save money by switching to another product that was less hazardous and less expensive. The amount of money saved was subtracted from his budget, despite the fact that the material was not purchased by his budget. No credit was given for his time and effort in researching, trialing, and evaluating the product, and this experience left the manager with a sense of frustration and unwillingness to try this type of process again. This kind of experience undermines the capacity to innovate and reduce costs in the future. “Structures of which we are unaware hold us prisoner” (Senge, 1990). This theory-in-use assumes that revenue generation is the only means of quantifying productivity and success and does not take into account the true cost of doing business, which includes the responsible stewardship of chemical, biological, and radiological materials.

The healthcare industry is based on consumption of goods and services and on budgeting of resources; the efforts at cost avoidance don't often fit into the existing measurements of progress. How should the rate of consumption (for something that is not able to be reimbursed) be measured and documented? An example is hazardous waste disposal. In most hospitals, the individual items being disposed are an overhead expense. The life cycle cost of hazardous waste – including disposal - is not taken into account

because it cannot be billed to the patient or third party payers (such as health insurance companies), the prime source of revenue for a hospital. Unlike car maintenance, where hazardous waste disposal costs are charged back to the consumer, there is no equivalent in healthcare for recouping costs of hazardous waste disposal.

New Hampshire Hospitals

In New Hampshire, there are 55,401 paid employees in healthcare (Environmental Protection agency Sector Notebook, 2005). There are 26 acute care hospitals in New Hampshire, and half of them are designated as federal Critical Access hospitals. The Critical Access hospitals are facilities that receive cost-based reimbursement from Medicare. This additional financial support was directed to facilities threatened by closure as part of the 1997 Balanced Budget Act and is called the Medicare Rural Flexibility Program. Hospitals can receive the designation as Critical Access hospitals if the facility is located over 35 miles from another hospital, or 15 miles in mountainous terrain, and if they have maximum of 25 licensed beds (Critical Access Beds Frequently Asked Questions, 2007). These are the smallest and most remote hospitals in the United States. Half of New Hampshire's hospitals have this designation, about the same percentage as the rest of the United States (Health Care Environmental Resource Center, 2008).

How do New Hampshire hospitals differ from their counterparts in other states?

There are three strong characteristics that delineate New Hampshire hospitals. First, hospital environmental managers strongly value autonomy. Many of the managers voiced a strong opinion that they wanted to be able to manage their own affairs. Although they worked within the confines of a highly regulated environment, there were aspects of their work, such as learning, that allow them liberty to make their own choices (Chene, 1983). There were no

labor unions in the study hospitals and almost no outsourcing. While the desire to be one's own master is at first an admirable trait, like all things, it can be taken to an extreme and can develop into isolation, which was also reported by managers as an aspect of their work life. Some managers also valued interdependency, which balanced autonomy of self with membership in a larger organization.

A second characteristic of New Hampshire's hospitals is that its state government is small, not only because it is geographically compact, but because there is a strong value placed on limited government. Unlike its adjacent neighboring states, there is no separate oversight agency for hospitals, and New Hampshire hospitals have more latitude to govern themselves. There is more room to maneuver without additional regulation at the state level. This allows a bit more room for change in a generally highly reactive and bureaucratic environment.

The final characteristic is that, in New Hampshire, hospital managers know who to call when they need help with state level environmental issues. The managers in the study all knew the Pollution Prevention Coordinator for the state of New Hampshire and had attended training sessions and meetings with her, organized by the Hospital Association. This was noted as an unusual and welcome situation. Most states do not offer public access of industry to the environmental regulators and technical assistance personnel to the degree seen in New Hampshire (Mary, 2007). All of the participants in the study expressed enthusiastic support for working at this level to resolve their problems or answer their questions. Unfortunately, many environmental regulations are federally mandated and out of the jurisdiction of the state. The Hospital Association, the state Department of Environmental Services, and the EPA Region I Pollution Prevention Office staff work together on

programming for the hospitals for quarterly meetings of the Hospital Association, which are well attended. The meetings also provide some time for networking. The biggest challenges to this type of networking are the travel distances for each manager and if the environmental manager is granted time to leave the hospital to attend the meeting.

Hospital Subcultures

All organizations have at least one corporate culture (Atchison & Bujak, 2001). Hospitals are large and complex organizations that have two subcultures: guilds, which represent the expert knowledge of doctors; and collectives, which represent the collaborative work of nursing and other technical staff. Atchison and Bukak explained that these subcultures have traditions, prerequisites for entry, networks, and other means of bonding and supporting their mutual needs and interests. Both groups need to be represented by and collaborated with by both administrators and environmental managers. The environmental managers need to understand sub cultural differences and learn how to find common ground with others in the hospital. Learning the norms and vernacular can be fundamental to establishing credibility. For example, in trying to communicate about a new regulatory requirement, managers could orient their language toward standards, performance, and control for doctors. For nurses, managers could explain the advantages to the group as a whole, in respecting the nurses' affinity for collaboration. This is a simplistic example, but managers do need to learn how to translate and fine-tune their communication to meet the norms and values of each group and maximize their credibility and effectiveness.

Guild membership in hospitals was developed to maintain autonomy while asserting control. Doctors are generally not hospital employees, yet as independent contractors they have all of the access and use of the facilities as other employees without many of the

restrictions (Starr, 1982). Hospital administrators have tried to weaken the control of physicians in hospitals by creating professional employee positions that operate as physician extenders, without the power or prestige of being a physician. Examples of this include physician assistants and nurse practitioners. The guild membership is based on the individual and on self-interest of the physicians, and physician extenders are not granted access to guild resources or status (Atchison & Bujak, 2001). The major influence is accomplishment and power. Guild members may or may not value mission statements, and trust may or may not exist outside of guild membership. Guilds have their own embedded tradition of education. Through apprenticeship, hospitals can staff beds with residents, who work long hours to provide physician coverage while completing their education. Atchison and Bujak (2001) explained that mentoring is a strong influence in guilds, and the mentors of each future physician have significant power over their subordinate's future career. They describe the personal attributes of guild cultures as embracing "achievement, risk-taking, stamina, intense focus, quick decision making, and personal accountability...." (p 73).

The second subculture is that of collectives, and these collective comprise the majority of staff positions in a hospital. Atchison and Bujak (2001) described individual members of collectives' behavior as "work in groups, tend to avoid conflict, are not risk-takers, and tend to be very thin-skinned..." (p. 72). The collectives consist of nurses, who, for the most part, already understand and appreciate the environmental/public health connection that environmental managers are trying to make. Nurses interface with the wide variety of racial and ethnic cultures and socio-economic differences represented by their patients. They create a cohesive bond between themselves as colleagues to counteract the constant cultural interplay between the varying cultures of patients, and the ethical dilemmas

they experience between their own goals and the goals of administrators and physicians (Chambliss, 1996). Individual leaders and organizations representing nurses have worked for policy changes to improve environmental conditions: nurses are usually the first employee group to ally with an environmental manager. Because nurses' orientation is focused on problem solving, they are predisposed to identifying problems and creating solutions. Nursing, as a profession, has sought solutions to environmental problems far beyond individual hospitals in the healthcare industry.

Environmental managers are the sole practitioner of their work in a small hospital, unlike the multiple positions held by other professions. Environmental management is a relatively new job position in hospitals, and most New Hampshire hospitals do not employ a person with this dedicated job responsibility (only three hospitals in the study did). However, larger urban hospitals have had dedicated multiple staff positions in the environmental field for many years, often in tandem with health and safety. But in rural areas in New Hampshire, the work of hospital environmental management is often delegated as an otherwise specified task. There is also little agreement of what responsibilities are covered by this job position. The job position is often found in Housekeeping or Facilities Management. Despite the fact that the job is usually only covered by one person, this manager must provide coverage around the clock in the event of emergencies such as hazardous material spills. They do not usually have colleagues to share the coverage, talk about the workload, and ask for advice or help. It can be lonely and isolating if the environmental manager does not reach out to staff in other departments. It is also imperative that the manager find a way to effectively work with each subculture within the hospital by finding common ground and building mutual trust and value in each other.

Compliance

During the interviews with the environmental managers, they spoke frequently about compliance inspections, matrices, standards and obstacles to their learning. While these issues were not directly related to my research questions, these issues have some influence on the learning process.

Inspections

There are indications that other hospitals are struggling to learn how compliance is implemented. New Hampshire's hospitals are covered by RCRA (Resource Conservation and Recovery Act) in EPA's Region I, covering the New England States. Region II is found directly west of New England, covering New York and New Jersey, where large urban hospitals were the focus of RCRA inspections for two years. From Region II, there are data from environmental inspections in hospitals that demonstrates that hospitals do not understand the fundamental requirements of RCRA compliance (EPA Office of Compliance Sector Notebook, 2005). RCRA compliance is a key indicator of the quality of an environmental management program in a hospital regardless of size or location. This is because RCRA requires a management system for all hazardous materials, so that the hospital needs to know what is *hazardous* and why, and what is *waste* and why. Many other environmental management decisions flow from a hospital's initial determination of how to manage the hazards posed by chemicals, drugs, and other materials common to the healthcare industry. Because large urban hospitals in Region II demonstrated fundamental RCRA non-compliance, can predictions be made about RCRA compliance in small, rural hospitals? There is no evidence to make such a claim, but it invites closer scrutiny in the future.

It is not known if a direct relationship between the professional competency of the small rural hospital environmental managers and the results of inspections exists in New Hampshire because inspections have been limited to a few urban hospitals. There may be data for Region II (New York and New Jersey) urban hospitals that could be assessed, but it might not inform small rural hospital environmental management. I chose not to focus on the outcomes of compliance because I suspected that learning played a larger part in compliance than was previously thought. Without testing competencies and comparing them with inspection data or conducting third party audits, I cannot support a claim that how the environmental managers learn to do their job has a relationship with RCRA compliance. I also would not have had the enthusiastic research participation that I enjoyed by focusing on the process of learning, since competency and compliance outcome information could jeopardize their work and future employment. My investigation of a correlation between compliance and manager competency would have been considered as hostile as a regulatory inspection.

It is difficult to extrapolate any conclusions from the high-profile inspections in New York and New Jersey because, except for the Memorial Sloan Kettering Cancer Center (Depalma, 2004), most hospitals have not been publicly identified. These data will be available in time and, in the future, may inform possible connections between demographics and compliance. The recognition that some hospitals are not meeting federal environmental regulations is an outcome, and the root causes need to be identified in order to bring the facilities into compliance. Of the variables that influence compliance such as resource allocation and organizational values, how the work of environmental management is learned certainly plays a part in whether hospitals are compliant. The extent of this is not known.

Matrices

Inspections are one external means of determining whether a hospital is following prescribed behaviors as they relate to specific environmental requirements. Having a means of assessing work performance internally on a routine basis is more useful for ongoing operations, setting and meeting goals, and evaluating program effectiveness. Matrices are units of measure created to establish baselines, create goals and assess progress. For example, when hospital environmental managers began recycling programs, they used existing matrices from the recycling industry, such as tons of material or rate of recovery of materials, (McRae et al., 1993). Standard matrices are essential tools that managers use to develop their programs, and identify what resources – including their own learning – that they need to accomplish their work. It wasn't until the mid 1990s that Laura Brannen and the staff at the Dartmouth Hitchcock Medical Center in Lebanon, New Hampshire developed a spreadsheet that tracked all materials coming out of a hospital, including all waste streams. Hospital waste is further complicated to track because hospitals often donate materials to other hospitals and healthcare facilities, to doctors taking healthcare compassion missions abroad (supplies and equipment that are often very valuable), and other non profits. Tracking everything—whether it was donated, recycled, sent off for special treatment or landfill disposal—provides direct evidence of the complexity and responsibility of handling waste with dozens of locations, treatments, and potential liabilities to be addressed for the disposal of everything from confidential patient records, to food waste, used pharmaceuticals, radiological, human tissue, and laboratory chemicals. It also provides life cycle tracking costs for these materials which helps track expenses and target high-cost and risk materials for

future product substitution. It gives managers a sense of legitimacy in the organization, validates the need for the work and the value that it can have to the hospital. It ties the work of environmental managers into the rest of the organization. Most of the participants in the study had data on waste leaving the facility, such as weights of materials going to the landfill for disposal, or volumes of hazardous wastes being taken by special vendors for incineration. They did not have the capability to track other materials or waste streams.

Standards and Certification

Almost every professional level staff position has some level of standards and/or a certification process that has prerequisites, continuing education requirements, and the opportunity to network with persons in similar position within the same industry. Environmental managers do not have this, and as there is little agreement about the extent of the job, training requirements, and continuing education needs, it would be difficult to find consensus about what a certification would look like and even if it would be beneficial for small rural hospital environmental managers. The nonprofit Center for Healthcare Environmental Management began a Certification in Healthcare Environmental Management, a four-day course, followed by a fifth day examination process, in Pennsylvania in the 1990s. It covers federal environmental requirements and costs \$1,700, not including room and board and travel to Pennsylvania. Many other contractors also offer menu-driven training courses on safety, materials, and waste management. Training requires a long absence from the job, often without someone else to cover for the trainee's absence, and a significant cost, when there is no legal requirement for training. There is no consensus on what needs to be covered and no coverage of state-level requirements. Under these circumstances, environmental managers are unlikely to attend these training sessions. As

with the issue of matrices, having a standard or credential is just as important as having a program that is worthy of measurement and management. Having a measurable budget and program, meeting external standards helps gain environmental managers entrance into the hospital management culture, and this status has some – yet to be quantified - impact on the learning and doing of the work.

Learning

If environmental managers operate at the fringes of the hospital culture, they miss many opportunities, including learning. In addition, three obstacles—staff coverage, cost, and economies of scale—present persistent challenges to environmental managers in small rural hospitals and prevent them from traveling to get to training. Learning can be conducted in many ways, and conferences are an additional method to formal training sessions. While nursing and physician conferences often offer continuing education credits for attendance, there is no equivalent for environmental managers because the position does not yet require any formal training. There are many opportunities available for managers to learn, but the most significant obstacle seems to be that there is no one to cover for managers while they attend training off site. A manager's knowledge of the facility is difficult to duplicate for others to utilize in the event of an emergency. Managers are often the only ones responsible for picking up wastes, cleaning up spills, handling chemicals, and arranging for disposal. If they were perceived as legitimate and valuable employees, resources would be made available to meet the need and get them to where they need to attend training and meet the work demand. In the meantime, adequate coverage in the absence of the environmental manager may pose a risk for hospitals without backup personnel.

A second obstacle is cost. A training budget needs to include the tuition, travel, and room and board costs because many training programs are multi-day sessions or conferences. Many managers reported that they were allowed to attend one conference every other year, but if regulations, technology, or policy changed, they had to learn about them independently. This is a huge potential obstacle, one that could possibly be addressed in the future with the use of distance learning opportunities.

Economies of scale are a third obstacle for the providers of this kind of training because the courses are generally organized to meet the needs of large facilities in urban areas, whose needs are different than those in small rural hospitals. The specialized nature of this training requires marketing and delivery of the training in urban areas, forcing rural managers to travel even greater distances to reach training opportunities. Online training may provide more opportunities in the future: the infrastructure for on-line training is just developing in healthcare environmental management. There are websites used by environmental managers, but learners at those sites must determine the context of the information at those sites for themselves.

Additional learning challenges include accommodating individual learning styles, comfort with computers, and the overall value of learning at the hospital for all members of the organization. Determining the relevance and accuracy of data found on computer web sites can cause learners anxiety and undermine learning. A lack of confidence in interpretation and translation of technical information into practice can also negatively impact learning. Understanding an adult learner's optimum learning style helps programs match teaching resources to learning needs. An individual's learning style informs the delivery system of learning for managers. Kolb's (1984) work on optimal learning

environments found “By bringing together immediate experiences of the trainees and the conceptual modes of the staff in an open atmosphere where inputs from each perspective could challenge and stimulate the other, a learning environment occurred with remarkable vitality and creativity.” (pp. 9-10) Some individuals learn by direct experience, by thinking about something in theoretical terms, by watching, or by reading about something, and offering learning experiences in only one means of delivery may leave out equally relevant styles of learning. Computers can be an important part of a learning experience, but having a person available to answer questions and having the opportunity to incorporate a hands-on activity or watch someone else perform a task helps to reach all learners.

Environmental managers also learn through their involvement in a group. The term *learning organization* describes a body of persons who share a value in learning and who create an environment where learning is an integral part of the group is moving forward as a whole. This is in contrast to individuals gaining knowledge for their own benefit and using it as commodity in a competitive environment. “Organizations learn only through individuals that learn, and individual learning does not guarantee organizational learning. But without it, no organizational learning occurs” (Senge, 1990). Guild and collective subcultures within a hospital have been examined as members of a learning organization; there is a wealth of data on nursing in particular. The “outdoor” element - what happens when pollutants reach the outside of the hospital - of environmental management has also been reviewed extensively. But an operational focus on the reduction of volume and toxicity of all materials within a hospital is a fairly new enterprise. Learning how to do this is practicing public health on the behalf of a larger community.

CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS

Summary of the Findings of the Study

Environmental managers learn in a process that begins when they apply their own experience to a new field. As the managers define their work, they attain proficiency in the content and context of their work. Those managers who adopted shared organizational values and vision also created an environment that encouraged innovative environmental practices. The synergy of learning with a value driven purpose gives managers the opportunity to become credible leaders. The alignment of personal, professional, cultural and external factors all work toward the successful learning process for these managers. Each manager has different strengths, and the complimentary manner in which these strengths support each other differs as well. Managers who are strong enough to stand up to the challenges they face can better deal with a challenging hospital culture, for example. Each manager's weakness also varies. The managers described many weaknesses, or obstacles in their learning process, many of which they successfully overcame and some that they continue to address.

External obstacles to learning include the lack of standards and matrices for developing baseline management practices in small hospitals. These obstacles inhibit the managers' ability to hold their programs and budgets accountable and valuable to the hospital. Without the ability to demonstrate the necessity of their work, as defined by an outside source, as well as their performance within a construct of expected behaviors or outcomes, the managers face challenges to their authority and legitimacy. The lack of standards affects the learning process in two ways. First, it directly affects the manager because without standards, the job description may be less clear, and learning needs are open

to interpretation. Secondly, the learning process can be affected indirectly when managers are perceived to lack authority or legitimacy. In an environment where resources – including financial resources to pay for continuing education – are scarce, some managers may not be thought of as important enough to invest limited resources.

Hospital environmental managers can experience internal obstacles to learning including powerlessness; difficulty in the discrimination of technical information and navigation of complex organizations; as well as fear and isolation. All of these obstacles can impede the managers' ability to access information, learn, and implement what they have learned. Despite having resources around them in which to learn the job, they lack the inner resources to access or implement it. This was an obstacle that some managers had to overcome before moving forward and acquiring the skills that they needed to do the job.

Environmental managers in New Hampshire's smallest hospitals have many attributes to their learning process that are working well for them: the first is attitude, and many of them described themselves as taking initiative and valuing autonomy. This includes making their own decisions, and being able to complete the necessary work without help from others. Autonomy also means having the freedom to decide how to organize their work and seek guidance as needed. They want to do their job right, and they value hard work. They have a high level of commitment to the larger mission of their facility, although many reported significant struggles with their peers, mostly from others' lack of respect and appreciation for the relevance of their job.

There are other challenges outside of peer conflicts within the hospital. Structural and organizational obstacles may exist. Managers may struggle for relevance in a job that is not well defined either by the organization or federal environmental regulators. There are no

external requirements or commonly recognized job description responsibilities, as there are with many managers in other departments at a hospital. There are no standards to track either their internal or external performance or matrices to quantify the success of their programs. They might also struggle as a manager of a non-clinical, non-revenue generating department whose success is often accomplished in cost avoidance and waste reduction, not by revenue generation.

Their last challenge is that they usually often hold their job by default and have other pre-existing job responsibilities as well as having no peers to sustain or mentor them. In New Hampshire, however, the Hospital Association has a strong informal network in which many of the managers are active as time and travel distance allow. This networking allows the managers to create their own networks and maintain relationships with others with similar professional interests. The Association sponsors several meetings a year, traveling to different hospitals in order to get managers to see other hospitals, and to move the meeting so that people do not always have to travel far to reach a meeting. Each meeting has visiting speakers come to discuss and inform the managers on changes in regulations or management practice, as well as introducing new technologies that apply to their work. The meetings sometimes offer a tour of the hospital and lunch which further promotes networking. Use of the internet extends the Hospital Association's ability to begin and maintain conversations and get questions answered by a peer once they return to their own hospitals.

Implications for Current Theory

This study is a first step in generating theory about how hospital environmental managers learn the work of environmental management. It is also the beginning of the development of a core theory for the field of healthcare environmental management. The

study design created limitations, such as not determining how learning impacts compliance rates. The study used grounded theory to introduce managers who struggled or succeeded in the learning of a job that often had few parameters. This study also identified questions for future consideration by allowing the managers to describe their own experience: their responses generated the questions themselves.

Grounded theory has introduced us to the voices of these managers, and allowed us a snapshot of how this group of people -in these jobs, in this small state - sees their world. By taking this first view, and comparing and contrasting with other existing theories, we gain an understanding of the working and learning world of these managers. The study's strongest implication is that it has introduced us a learning environment that was not known before. Part of that exploration involved a great deal of interpretation.

When the study began, it was not clear if it would turn out to be interpretative or a more positivist explanation of observations. Charmaz (2006) defined positivist theory as that which "seeks causes, favors determinist explanations, and emphasizes generality and universality" (p. 126). What was learned from the hospital environmental managers could not be described as a universal theory of learning. It is believed, however, that it meets Charmaz' definition (2006) as an interpretative theory, which "calls for the imaginative understanding of the studied phenomenon...assumes emergent, multiple realities; indeterminacy; facts and values as linked; truth as provisional; and social life as processual" (p. 126). One effect of generating an emergent theory of how hospital environmental managers learn to do their job is to question the validity of continued investment in technical assistance and regulatory inspections as effective means of changing behavior in this population. Another reason to develop an emergent theory is to better support learning

delivery systems and to begin to develop a core theory for the new field of environmental management in hospitals, both small and large. An emergent theory would be appropriate for hospital environmental management, a nascent specialty within environmental management.

The creation of an interpretative or emergent (Charmaz, 2006) theory is a beginning of understanding how the environmental managers in small, rural hospitals learn to do their jobs, continue their education, and sometimes innovate in their facilities. These data contributes to the development of the new field of hospital environmental management.

Sarason (1988) described the development of community psychology as a new field:

I trust that I have made it clear that I believe any field of human endeavor, especially if it is in the human services, should be judged by the degree to which it understands and is responsive to the social forces and structures that produce or help maintain human misery (p. 289).

Sarason (1988) also demanded that a body of work could only be considered a new field onto itself if it had "...a distinctive core of theory, a recognizable focus derived from, or capable of being integrated into..[other fields of psychology]" (p. 406). These were not illegitimate concerns. After all, because a field is new is no warrant to give it status or resources (Sarason, 1988). The generation of theory can alter a person's perspective and "when you theorize, you reach down to fundamentals, up to abstractions, and probe into experience"(Charmaz, 2006, p. 135) opening new opportunities for this work to be seen as not only necessary but helpful in promoting places of wellness—not just of treatment. As hospital environmental management has found its own place as an independent body of work, it will need to continue to generate and refine its own theory and practice.

Implications for Current Practice

This study has implications for learning, both individually and organizationally. This work can help hospital environmental managers to identify their own learning needs and preferences in order to maximize their limited resources for learning their job. For example, they could seek a mentor, or find a peer to share practice management and strategies. The data from the managers supports Bryant and Wilson (1998) claimed that “A more reflective approach is required that seeks to rethink the basic premises of environmental management as a process...” (p. 325). They (Bryant and Wilson, 1998) believed that one of the main weaknesses of environmental management work is that it has “Largely eschewing social theory, environmental management developed as an applied field of study firmly linked to state policy-making” (p. 328).

A hospital is a unique social atmosphere in which to place environment management - with its origins in engineering and control management - where the norms and values are different from other industrial settings. Without giving serious consideration to social theories, especially of how individuals and organizations learn, the practice of environmental management will suffer from arrested development. Managers in the study who succeeded in embracing both the humanity and technology of their learning environment were the ones who also were recognized leaders within their organizations.

From an organizational perspective, the findings of this study identify the many obstacles that hospital environmental managers can face as they attempt to learn within and without the organization itself. This study cited a lack of trust and legitimacy as being significant obstacles for environmental managers who were trying to acquire resources, which included access to and funding for training and other learning opportunities.

Recommendations for Further Research

There are three areas of inquiry that in the future may expand a theoretical understanding of the learning process as it relates to environmental management practices in small hospitals. The first is the connection between adult learning and learning organization theories. How do individuals in this specific setting apply their learning directly as a member of a larger group, and how, when they are alienated, it can affect both their own learning and that of the group as a whole? The role of alienation and its impact on learning for the manager and the hospital as a whole could be further investigated: this study only found that it could play a role; the extent could be quantified in future work.

Second, future study of how matrices and standards might influence the learning process would broaden theoretical understanding of this learning process. If hospital environmental managers have a specific standard to meet and maintain, how does this additional requirement impact their initial learning and maintenance of skills? Would they still follow a similar process, even if a standardized process were in place to learn the job? This study did not specifically ask hospital environmental managers about standards and matrices, but several respondents volunteered that their work was negatively impacted from the lack of standards. This originated in the perspective that they could not demonstrate a need for initial or additional training, as required or recommended by some credible external credentialing organization.

A third step would use the result of this study to begin a dialogue with other managers in other areas of the country. Half of the hospitals in the United States are small and found in rural areas. Regional differences, individual state and federal regulatory and policy

interpretations exist, as do state level oversight of hospitals: all of these provide variables that could test whether this study could be effectively replicated.

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APPENDIX A

Interview Guide

Open-ended question: Tell me about your job: what is it and how did you learn to do it?

Probes:

What was your previous professional life?

Why are you motivated to do this job?

How do you maintain or acquire new skills?

Do you use technology in this job?

What formal professional development options are available to you?

How do you stay abreast of new developments in the field?

How would you prefer to learn about new developments in this field?

Do you utilize any formal or informal networks?

Do you have a mentor in this job, and have you ever mentored someone else?

How do you keep track of information such as regulatory changes?

Do you train individually or with other staff, and how did you learn to train others?

Do you use other resources and if so, what are they?

What is the hardest part of your job?

Do you define your job as a “job” or as a “career”?

Open-ended question: Tell me about how you learned and continue to learn how to comply with environmental regulations?

Probes:

What is your definition of compliance and how important do you think compliance is?

Can you define what compliance means to you, and how you attempt to achieve it?

How do you perceive the value of your work and the importance of complying with environmental regulations?

How would you describe your organization's ethical environmental responsibility to the community it serves?

Is there some guiding framework that helps you organize and prioritize your work, and if so, did you create it? How?

Have other parties ever formally or informally assessed your environmental management performance? Describe that experience.

What are your expectations of external agencies such as the EPA?

Have you accessed or would you access technical assistance programs?

Do you use resources such as the Internet to gain information on or manage data for compliance?

What is your opinion of the public scrutiny regarding non-compliance with hospital environmental management?

Where would you place your facility in a continuum from non-compliance to excellent management practices?

What are your objectives to maintain or attain compliance?

What are the organizational constraints to establishing an environmental management program in a rural hospital?

How do environmental managers navigate the complexity of a hospital organization?

What hospital committees do you serve on?

Open-ended question: Tell me about an experience with trying to create an innovative environmental program—one that went beyond compliance requirements.

Probes:

What is your experience with innovation?

What are the challenges to effecting innovative change at your hospital?

How are new environmental management ideas diffused in the hospital? Can you provide an example?

What internal processes are involved?

Do you have the latitude to suggest, attempt, and evaluate new ways of doing things, such as pollution prevention?

What kinds of “fires” are you putting out, and what is your workload like?

APPENDIX B

INFORMED CONSENT FORM

**Consent Form: Initial Interview and Observation Research Project:
“How Hospital Environmental Managers Learn, Understand, Achieve or Fail
Compliance”**

Principle Investigator: Victoria Jas, doctoral candidate
Antioch University New England
Keene, New Hampshire

Dissertation Committee:

Thomas Webler, PhD., Chair (Antioch University New England)
Steve Guerriero, PhD. (Antioch University New England)
Barbara Sattler, PhD. (University of Maryland)

Objectives

I am studying how environmental managers learn their job, comply with federal environmental regulations and create innovative best management practices in their hospitals. I am working with rural hospitals in New Hampshire to understand and improve environmental management practices specific to these smaller facilities. This information will be shared with state and federal environmental regulators and pollution prevention staff, hospital associations and others interested in hospital environmental management. Site specific information remains confidential.

Participation

You are being asked to give a brief tour of your facility: that should include specific aspects of the program, such as container management. After the tour, you will be interviewed for approximately two hours. You may also be requested to participate in a later one hour interview (without a tour). You will be asked to describe your job, how you learned to do it, and how you learn and maintain your skills. The hospital environmental manager's participation is voluntary and involves no compensation. The purpose the initial interviews is to observe environmental programs and interview the managers of these programs in order to understand how they learn their job, comply with state and federal environmental regulations, and create innovative programs in their hospitals. Interviews will be scheduled and conducted in private at a location of choice to the manager.

Risks and Benefits

The participant is being asked to describe their job and how they learned to do it. Participants may divulge information about their job that they prefer to be kept confidential, which it will be. The benefits of understanding how hospital environmental managers learn and do their job are that efforts can be directed to help them based on what their specific needs are.

Questions

Questions regarding the research project may be directed to or Victoria Jas or Thomas Webler. Questions regarding your rights as a research participant may be directed to George Tremblay. Focus group participants have the right to ask any questions regarding the research, and they will be answered fully.

Victoria Jas

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Consent

I, _____, give my
consent to participation in observations and interviews. I understand that I can request
hard copy or digital access of photographs taken at my hospital, and that patients or
visitors will not be photographed. I will receive a report specific to my hospital as well
as general findings of other hospitals that does not identify individual facilities.

Date: _____

Signature: _____

Principle Investigator Signature: _____

APPENDIX C

CODE LOCATIONS

READINESS TO LEARN

<i>Code Subfamilies</i>	<i>Individual Codes</i>	<i>Frequency</i>
<i>Informal Experience</i>	Comparing past experience with present needs	18
	Gaining awareness of educational needs	15
	Making change happen is very difficult	11
	Skill recognized but not the one needed for the task	9
	Education is piecemeal	10
	Computer help is not helping	7
	I really want/need help	5
	Regret of lack of education	6
	Comparing oneself to others	5
	Needs a checklist/primer of how to do job	4
	Motives for education	3
	Difficulty with learning information	4

READINESS TO LEARN, continued

<i>Code Subfamilies</i>	<i>Individual Codes</i>	<i>Frequency</i>
<i>Control</i>	Problem driven responses	21
	Taking initiative	16
	Being constantly frustrated	14
	Awareness of vulnerability	11
	Overwhelmed by the task at hand	11
	Being isolated by peers /management	10
	Sense of inadequacy	5
	EPA is scary/rigid	5
	Change is happening, and it is not good	5
	Lack of confidence hurts ability to approach peers	4
	Sense of powerlessness	4
	Hospitals are small and dependent but do not want to be	3
	Hard to work when threatened	3
	Enforcement is necessary in learning	3
Thin veil of insults/ridicule by management	3	

READINESS TO LEARN, continued

<i>Code Subfamilies</i>	<i>Individual Codes</i>	<i>Frequency</i>
<i>Control, continued:</i>		
	Fear of entrapment by regulators	3
	Sense of oppression	3
	Angered at being manipulated by fear	2
	EPA should take the lead in helping us (passive)	2
	Sense of abuse of power	2
	Acceptance of the job as it is	2
	Regulators work by frightening people	2
<i>Code Subfamilies</i>	<i>Individual Codes</i>	<i>Frequency</i>
<i>Perspective</i>	Wanting to do it/get it “right”	14
	Pride in work	13
	Sense of justice/fairness	8
	I am valued	6
	Sense of self evolving	4
	People don’t want to work with me	2
	Job is serious	2

<i>Code Subfamilies</i>	<i>Individual Codes</i>	<i>Frequency</i>
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Perspective, continued:

Transparency is important to Succeed	2
Autonomy is important to succeed	1
Risk aversion	1

MAINTAINING SKILLS

<i>Code Subfamilies</i>	<i>Individual Codes</i>	<i>Frequency</i>
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<i>Cognitive Skills</i>	Assessing needs, finding areas for improvement	29
	Building and Partnerships and Networks	27
	Delegating to get work done (internally)	19
	Making connections between actions and consequences	16
	I can access resources	14
	How to navigate as an individual in an organization	12
	Need to collaborate to succeed	16
	I learn/apply new ideas from my colleagues	11
	Hiring help to get the work done	11
	Translation/interpretation is part of this job	9

MAINTAINING SKILLS, continued:

<i>Subfamilies</i>	<i>Codes</i>	<i>Frequency</i>
	Talking to others is better than reading	8
	Critical thinking/synthesizing skills might help in determining relevance of information	6
	Importance of documenting what we know/do	6
	Conferences/prof memberships keep up my knowledge	5

<i>Subfamilies</i>	<i>Codes</i>	<i>Frequency</i>
<i>Pace</i>	Time constraints	16
	Needing to move fast	3
	Unrelenting pace affects my ability to prioritize work	3

<i>Subfamilies</i>	<i>Codes</i>	<i>Frequency</i>
<i>Barriers</i>	Dysfunctional infrastructure /bureaucracy	21
	There is a gap between available help and need	15
	I can't get the information that I need to do my job	12

<i>Subfamilies</i>	<i>Codes</i>	<i>Frequency</i>
<i>Barriers, continued:</i>	Expectations (external) are not met	13
	Trust- attaining and maintaining	13
	Invisible aspect of the job	10
	Supported by management	10
	Weight of many responsibilities	8
	Employees don't understand, won't change	7
	Outside experts have more credibility than I do	4
	Funding constraints	4
	Deadwood employees sabotage change	3
	Fear of negative publicity	3
	We can't afford quality help	2
	We only react in crisis management	2
<i>Subfamilies</i>	<i>Codes</i>	<i>Frequency</i>
<i>Uncertainty</i>	Definitions/scope/jargon lacks consensus and clarity	15
	Learning to maneuver through complexity	11
	Regulations don't fit our work	10
	Weight of many responsibilities	8
	Disconnect between job and job description	7

<i>Subfamilies</i>	<i>Codes</i>	<i>Frequency</i>
<i>Uncertainty, continued:</i>	Questioning status quo	6
	Compliance is a moving target	6
	Compliance is a constant worry	2

<i>Subfamilies</i>	<i>Codes</i>	<i>Frequency</i>
<i>Practice</i>	Value of long term professional relationships	13
	Respect from peers is critical to success	9
	Importance of mentors	8
	I am valued in my organization	3
	Transparency is important to succeed	2
	Autonomy is important to succeed	1

INNOVATION

<i>Code Subfamilies</i>	<i>Individual Codes</i>	<i>Frequency</i>
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Leadership

	Providing leadership within organization	17
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	Taking Risks to make Change Happen	7
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<i>Code Subfamilies</i>	<i>Individual Codes</i>	<i>Frequency</i>
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<i>Accountability</i>	Sense of accountability	18
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	Community service is our responsibility	4
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<i>Code Subfamilies</i>	<i>Individual Codes</i>	<i>Frequency</i>
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<i>Vision</i>	Creating and sustaining a vision	15
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	Teaching the “why” as well as the “what”	6
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	Communal commitment to environmental health	2
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INNOVATION, continued:

<i>Code Subfamilies</i>	<i>Individual Codes</i>	<i>Frequency</i>
<i>Catalyst</i>	Discovering and sharing a new perspective	12
	Synergy/catalyst for change	10
	Advocating: becoming the mentor	6
<i>Code Subfamilies</i>	<i>Individual Codes</i>	<i>Frequency</i>
<i>Reflective Practice</i>	Asking questions instead of telling people what to do	8
	Deep, quiet and sustained commitment to change	5
	Embracing the Humanity within Others	1
<i>Code Subfamilies</i>	<i>Individual Codes</i>	<i>Frequency</i>
<i>Communication</i>	Discovering/sharing a new Perspective	12
<i>Code Subfamilies</i>	<i>Individual Codes</i>	<i>Frequency</i>
<i>Scale</i>	Infusing a systems approach	20
	Super Ordinate Perspective	12

APPENDIX D

CODE LISTS

Needing to move fast
Motives for education
Wanting to do it “right”
Hiring help to get the work done
Taking initiative
Problem driven responses
Delegating to get work done (internally)
Gaining awareness of educational needs
Difficulty with learning technical information
Weight of many responsibilities
Time constraints
Sense of inadequacy
Skill recognized but not the one needed for the task
How to work (navigate) as an individual in an organization
Thin veil of insults/ridicule by management
Acceptance of the job as it is
Need to collaborate to succeed
Job is serious
Overwhelmed by the task at hand
Invisible aspect of the job
Sense of self evolving
Regret of lack of education
Pride in work
Importance of mentors
Education is piecemeal
Compliance is a constant worry
Regulators work by frightening people
Fear of entrapment by regulators
Awareness of vulnerability
Comparing past experience with present needs
Sense of abuse of power
Questioning status quo
Sense of powerlessness
Being constantly frustrated
Being isolated by peers
Expectations (external) are not met
Risk aversion

Coding List, continued

Hospitals are small and dependent but do not want to be
 Sense of justice
 Regulations don't fit our work
 Sense of oppression
 We can't afford quality help
 There is a gap between available help and need
 Respect from peers is critical to success
 Value of long term professional relationships
 Trust- attaining and maintaining
 EPA is scary
 Hard to work when threatened
 Sense of accountability
 Change is happening, and it is not good
 We only react in crisis management
 Dysfunctional infrastructure
 Compliance is a moving target
 Deadwood employees sabotage change
 Talking to others is better than reading
 Needs a checklist/primer of how to do job
 Employees don't understand, won't change
 Computer help is not helping
 Fear of negative publicity
 Supported by management
 Autonomy is important to succeed
 I am valued in my organization
 Transparency is important to succeed
 Providing leadership within organization
 Asking questions instead of telling people what to do
 I really need help

10-12-07

Importance of Documenting What we Do/Know
 Assessing Needs, Finding Areas for Improvement
 Disconnect between job description and job
 People Don't Want to Work With Me

10-14-07

EPA should take the lead in helping us (passive)
 Outside experts have more credibility than I do
 Angered by being manipulated by fear
 Community Service is our responsibility
 Making change happen is very difficult
 Lack of confidence really hurts ability to approach peers

10-15-07

Making connections between actions and consequences
 Communal commitment to environmental health
 I can access resources

10-16-07

Conferences/prof memberships keep up my knowledge

10-24-07

Creating and sustaining a vision
 Synergy/catalyst for change
 Funding constraints
 Super ordinate perspective

11-1-07

Embracing the Humanity within others
 Building Partnerships and Networks
 Taking Risks to make Change Happen
 Infusing a Systems Approach
 Reciprocity status (I have something of value)

11-12-07

Learning to maneuver through complexity
 Definitions/scope/jargon lacks consensus and clarity
 I learn/apply new ideas from my colleagues

11-13-07

Translation/interpretation is part of this job
 Teaching the “why” as well as the “what”
 Advocating: becoming the mentor
 Critical thinking/synthesizing skills might
 help in determining relevance of information
 Discovering and sharing a new perspective
 Deep, quiet and sustained commitment to change
 Unrelenting pace affects my ability to prioritize work

11-23-07

Enforcement is necessary in learning
 I can't get the information that I need to do my job

23 November 2007: 99 codes

APPENDIX E

CODE FREQUENCIES

Code Group	Code Family	Code	Total individual codes (total all interviews)
Readiness to Learn	Informal Experience	12	94
	Control	22	134
	Perspective	7	53
		41	281
Maintaining Skills	Cognitive Skills	15	189
	Pace	3	22
	Barriers	15	137
	Uncertainty	8	65
	Practice	6	36
		47	449
Innovation	Leadership	2	24
	Accountability	2	22
	Vision	3	23
	Catalyst	3	28
	Reflective Practice	3	14
	Scale	2	32
		15	143
	<i>total codes/total individual codes</i>	103	853
<i>Most frequently noted codes (half of all codes):</i>			
	Cognitive Skills		189
	Control		134
	Barriers		<u>137</u>
	<i>Total individual codes</i>		460