The Pennsylvania State University

The Graduate School

College of Education

ORGANIZATIONAL LEARNING AND DISASTER MANAGEMENT IN A COUNTY CORONER'S OFFICE: A CASE STUDY

A Thesis in

Adult Education

By

Bruce S. Rudy

© 2007 Bruce S. Rudy

Submitted in Partial Fulfillment of the Requirements for the Degree of

Doctor of Education

December 2007
The thesis of Bruce S. Rudy was reviewed and approved* by the following:

Fred M. Schied
Associate Professor of Learning and Performance Systems
Thesis Adviser
Chair of Committee

James T. Ziegenfuss
Professor of Management

Gary W. Kuhne
Associate Professor of Learning and Performance Systems

Robert F. Munzenrider
Associate Professor of Public Administration

Edgar I. Farmer
Department Head of Learning and Performance Systems
Professor of Workforce Education and Development

*Signatures are on file in the Graduate School.
ABSTRACT

This qualitative case study explores how a county coroner's office learns in the preparation for disaster management. A total of eight members of the coroner's office were interviewed and three themes were elicited from the resulting data. Additional conclusions were drawn based upon the responses of the interviewed participants.

Among the significant findings were that (i) learning occurred in both organized and informal settings; (ii) communication occurs mostly informally; (iii) members are encouraged to develop area of expertise. Additional findings included that single-loop learning occurred more frequently than double-loop learning, members engaged in both exploration and exploitation, and that despite a lack of awareness of the office's disaster plan the participants demonstrated an understanding of disaster management principles.
# TABLE OF CONTENTS

PREFACE ........................................................................................................... ix

Acknowledgments .......................................................................................... xii

Chapter 1: BACKGROUND ............................................................................. 1

   Emergency Management and Organizational Learning ......................... 1

   Problem Statement .................................................................................. 8

   Research Questions ............................................................................... 10

   Conceptual Framework .......................................................................... 11

Chapter 2: REVIEW OF THE LITERATURE .................................................. 14

   Introduction .......................................................................................... 14

   Organizational Context of Disaster Management ................................. 14

   Organizational Learning ....................................................................... 30

      Significance of Organizational Learning and Emergency Management .. 33

      Empirical Studies of Organizational Learning ................................. .35

      Empirical Studies of Disaster Management .................................. 40

   Summary .............................................................................................. 54

Chapter 3: RESEARCH METHODS ................................................................. 55

   Introduction .......................................................................................... 55

   Research Questions ............................................................................... 55

   Definition of Terms ............................................................................. 56

   Design of the Study ............................................................................. 56

   The Qualitative Research Paradigm .................................................... 57

      Case Study Methodology ................................................................. 59
CHAPTER 5: CONCLUSIONS.................................................................88

Introduction.....................................................................................88

Outcomes.......................................................................................88

Single-loop learning.......................................................................104

Both exploration and exploitation are present.............................104

Members demonstrated knowledge of disaster management principles. 104

Implications and Recommendations.............................................108

Disaster Management.....................................................................108

Adult Education..............................................................................109

Further Research...........................................................................111

REFERENCES..................................................................................113

Appendix A Recruitment Script.....................................................125

Appendix B Research Questions....................................................126

Appendix C Transcript.....................................................................128

Appendix D Interview Coding Graph............................................129

Appendix E Consent Form..............................................................130
PREFACE

While organizational functioning has always intrigued me, I became more interested in the disaster aspects following a few experiences. Of particular interest are the manners in which disasters or crises are managed. I personally experienced the tornado that struck Campbelltown, Pennsylvania on July 14, 2004. In fact I drove through the storm unknowingly due to the severe thunderstorm and extreme darkness that occurred at 3:00 p.m. on that day. While my residence was not structurally damaged, we did experience downed trees and roof damage that required replacement. I was however able to observe first hand the destruction, the immediate homelessness of neighbors, and fortunately the critical injury of one neighbor who miraculously survived. Even though our days were busy with cleanup I was able to observe the organization of the disaster first hand rather than be dependent upon a newscaster’s version of the events as we had no power for several days.

Initially emphasis was placed upon searching of the downed homes. 30 homes were destroyed completely or uninhabitable with an additional 30 damaged. Once the initial casualties (known injured persons) were sent to the hospital, the damaged homes were searched for victims if there were confirmed occupants. Fortunately many of the homes were unoccupied at the time due to family members at work, while many families were away on vacation. Once a house was cleared for immediate injuries the house was marked with fluorescent spray paint (removable) that the home was cleared. Once additional reinforcements arrived a second round of home interviews was conducted to verify that all household members were accounted for. A temporary housing station was immediately designated at the Campbelltown Fire Station for those who were without structural protection as another storm but much less significant arrived around 5:30 p.m. In the mean time multiple agencies arrived including the county emergency management
agency. The fire station was designated as the command center for the operation, where press
briefings were provided as well as meals for victims and volunteers. Portable toilets were
brought to the neighborhood by nightfall as many occupied households were without running
water. At approximately 10:00 structural engineers inspected each home externally and
internally to search for structural damage and render a decision as to the safety of occupying the
residence. The neighborhood was declared a disaster area; multiple police agencies enforced
restricted access to the neighborhood as well as enforced dusk to dawn curfews. Volunteers
were organized and transported from the fire station to needed areas versus milling through areas
searching for a task to perform.

I'm intrigued by chains of command such as the questioning of the pecking order
following the assassination attempt of President Ronald Reagan in 1981 where former Secretary
of State Alexander M. Haig was criticized for stating that he was in charge at the White House
(Regan, 1988). I also interested in which organization has jurisdiction during certain events. For
example, following the assassination of President John F. Kennedy a dispute occurred between
the Dallas County Coroner and federal authorities regarding the removal of the late president's
body to Washington, D.C. The coroner argued that a homicide had occurred within his
jurisdiction and he had sole custody of the body, while the federal authorities won by physically
removing the body (Lifton, 1980; Manchester, 1967).

As a deputy coroner myself, I frequently think about these types of events and how I
would handle them. However I realized that even though I may have a plan (good or bad) others
within the organization may not. Furthermore even if I had developed a world renowned plan,
my absence would render the plan useless unless the other members of the office were
knowledgeable and in agreement of our roles, visions, tasks with the authority to enact the
disaster plan. I am reluctant to call the plan “mine,” as it should be accurately called “our” plan. The other members of the organization should be active members in the planning, discussing, implementing, of the plan. Furthermore all members will have insight and input based upon experience that other members will not have. Part of these beliefs is research driven based upon course work within adult education and public administration programs. Textbooks utilized within these courses consistently discussed the need for participation and called for a voice from the membership (Argyris & Schon, 1978; Brookfield, 1995; Cervero & Wilson, 2001; Cummings & Worley, 2001; Knowles, 1984; Senge, 1990). The other aspect of this belief is personally driven in which I have personally experienced management detached from the membership, rendering decisions without consultation of the involved persons, apply blame to others when undesired results develop.
Acknowledgments

The list of people who made the accomplishment of this task successful would be exhaustive.

Special thanks go to Dr. Fred Schied who accepted me as an advisee and guided me through my studies, written comprehensive examination, and the dissertation. I appreciate the time and guidance provided by my other dissertation committee Drs. James T. Ziegenfuss, Gary W. Kuhne, and Robert F. Munzenrider.

I’d like to thank Ms. Christine Zongilla who transcribed the interviews and proof read several of my drafts.

A debt of gratitude is owed to all of the librarians who guided me through my searches for articles and textbooks; in particular a special recognition goes to Ms. Connie Rice of the Pennsylvania College of Technology for her assistance.

Appreciation is extended to Dr. Dennis R. Lott who rejuvenated by interest in pursuing a doctoral degree and to the late Dr. Rupert F. Chisholm who modeled the facilitation of classroom learning combined with an enthusiasm for action research.

A special recognition is extended to Drs. William J. Mahar and Ernest K. Dishner. Without their sense of fairness this degree would not have been possible.

Without the understanding and support of my wife Maureen and children Kathleen, Melinda, Marybeth and Jacob this journey would have been impossible.

This dissertation is dedicated to my brother, the late J.P. Rudy (October 22, 1960-June 3, 1985), who never got to pursue his graduate studies at Penn State.
CHAPTER 1

"No problem can be solved from the same consciousness that created it; we must learn to see the world anew." Albert Einstein in Schwandt and Marquardt (2002, p.16).

Background: Emergency Management and Organizational Learning

Disasters can occur unexpectedly or with some warning, and may affect an isolated unit or incapacitate a region of the world. An emergency management agency (EMA) is responsible for the management of a myriad of natural and man-made disasters. Waugh (2000) defines a disaster as when resources of individuals and families become overwhelmed. Eden and Matthews (1996) argue that a disaster also occurs when the function or resources of an institution are threatened. Waugh (2000) states in general terms that emergency management (EM) is a "...process of managing risk so that we can live with known and unknown natural and man-made hazards and can deal with the disasters that do occur (p.3). While Blanco, Lewko and Gillingham (1996) argue that disasters occur with little warning due to a breakage in the weakest link, Waugh and Hy (1990) and Waugh (2000) argue that the catastrophic events can be anticipated and measures can be taken beforehand to prevent them entirely or to minimize their effects. Examples of disasters include tornados, hurricanes, floods, earthquakes, as well as nuclear, biological or chemical explosions, cyberterrorism, and workplace violence. Worldwide disasters include the Exxon Valdez oil spill off the Prince William Sound in Alaska; Union Carbide's gas leak in Bhopal, India; Chernobyl nuclear accident in the Ukraine; World Trade Center bombing in New York City in 1993; Murrah Federal Office Building in Oklahoma City; the U.S. terrorist attacks of September 11, 2001 (9/11); and the tsunami of 2004.

Disaster management (DM), which is used interchangeably in the literature with EM, involves actions and demands resources beyond the means of individuals and family groups. In
early civilization societal members were self-dependent for problem solving or cooperated with nearby neighbors to rectify crises. Early EMA was demonstrated by the development of fire brigades. In the late 1800s fires destroyed large sections of cities such as the Great Chicago Fire and in Boston where 800 buildings were destroyed (Waugh, 2000). As societies became more complex, communities became more organized to deal with situations beyond individuals’ control. Initially organizations developed fire brigades which consisted of “bucket brigades.” As structures and communities became more technologically developed, advancement in agents’ skills was required. Additionally DM involves dealing with non-English speaking populations that brings its own special set of problems requiring special administrative and interpersonal skills (Waugh, 2000). Eden and Paul (1996) expanded the definition of disaster to that which threatens human safety, buildings, collections or items therein, equipment, and systems. To expand upon this definition, a water leak may not threaten human life in an unoccupied building, but may threaten the contents and overall function of a library or an art museum.

As societies became more developed and complex, a realization developed that their needs were not being met by the current preparations. The federal EMA (FEMA) originated from a presidential mandate during the Carter administration following the nuclear power plant accident at Three Mile Island in Middletown, PA (Waugh & Hy, 1990; Waugh, 2000). EMAs were a spin-off of early twentieth century civil defense programs whose main functions were the preparation and response to nuclear fallout in the event of a foreign attack (Roberts, 2006; Sylvés and Waugh, 1996). Similarly each of the fifty states, commonwealths, or territories of the United States has a state run EMA that facilitates county and municipal based organizations.

Waugh and Hy (1990) state that policies of EMAs are divided into four categories: preparedness, response, recovery, and mitigation. Preparedness occurs through the development
of response plans, identification of resources and the training of emergency services personnel, development of interagency and inter-jurisdictional response accords, and testing of response plans (Waugh, 1990). Response is the action taken when a disaster occurs, which includes emergency medical services, housing and food assistance, evacuations, as well as search and rescue operations. Recovery addresses the immediate problems of stabilizing the affected community and operational maintenance of life-support systems, providing foundations for long term recovery and reconstruction. Mitigation is the recognition of risk and the attempt to reduce and eliminate the consequences of the hazard. Mitigation is exampled through building codes and regulations for earthquakes and fire, land use regulations and flood control programs, as well as public facility plans controlling the storage and usage of hazardous materials (Sylves and Waugh, 1996; Waugh, 2000; Waugh and Hy, 1990). Coordination of multiple complementary agencies is a responsibility of an EMA during a disaster.

The national emergency management system is a complex network of public, private and nonprofit organizations and individuals from federal state and local agencies. Included within these agencies are private, public, non-profit, profit and ad-hoc organizations. Agency members can include full-time well staffed, highly professional and trained individuals, while other agencies staff part-time or volunteer actors, who are minimally trained and have limited technical and administrative capacities. Examples of federal agencies include FEMA, National Aeronautical and Space Administration (NASA), U.S. Geological Survey (USGS), U. S. Coast Guard (USCG), Federal Bureau of Investigation (FBI), United States Secret Service (USSS), Alcohol, Tobacco and Firearms (ATF), U.S. Army Corps of Engineers, U.S. Department of Defense (DOD), U.S. Department of Health and Human Services (HHS), Department of Homeland Security (DHS), U.S. Center for Disease Control (CDC), Environmental Protection
Agency (EPA), and National Oceanic and Atmospheric Administration (NOAA). State agencies can include state EMA, state police, Office of the Governor, and the National Guard. Local groups can be represented by municipal police agencies, county sheriff departments, county coroner offices, as well as municipal fire and police departments. Private for profit agencies can be exampled by utility services such as power, gas, water companies. Non-profit voluntary groups are represented by the American Red Cross (ARC) and the Salvation Army.

A problem encountered with EMAs is overcoming the image of the old civil defense “air-raid warden” who was usually equipped with a white helmet, whistle, and arm band. The image of these individuals is associated with the more modern term of “ambulance chaser” (Sylves and Waugh, 1996; Waugh, 2000; Waugh and Hy, 1990). Many of the early EMA actors were former or retired military personnel, who were familiar with the DOD style management which is a top down hierarchical administrative approach. Such a style is not necessarily conducive to coordinating the myriad of possible agencies previously identified. Additionally the post Vietnam anti-military sentiment did little to gain favor of these individuals with the general public. EMAs historically were run by political appointees with little to no experience or interest in the organization. While such political appointments are not unusual, the inappropriate appointments become noticeable due to the heightened media attention that accompanies disasters (Roberts, 2006; Sylves and Waugh, 1996; Waugh, 2000; Waugh and Hy, 1990). While subject to frequent criticism, the individual charged with maintaining and implementing disaster plans historically has limited experience and modest status (Kartez and Lindell, 1990). In some cases the disaster manager is an unknown entity. Upon personal inquiry of the identity of the disaster manager at an outpatient surgical center, most employees did not know the individual’s identity let alone that such a position existed. Additionally, following a disaster, an investigation
frequently follows, and finger pointing has frequently focused towards the various EMAs even though the agency received little attention, funding, or oversight by elected officials prior to the disaster. Advancements were made when EM became affiliated with other professional and academic organizations. In particular, affiliation with the Section on Emergency and Crisis Management of the American Society for Public Administration helped raise awareness and elevate the field’s professionalism and administrative skills. Large research universities created institutes devoted strictly to emergency management and disaster preparedness such as the University of Delaware and the University of Colorado (Waugh, 2000). The academic units focused on the application of theoretical framework and philosophical implications to DM. Additionally, organizations began developing certifications administered through the International Emergency Management Association (IEMA).

Contrary to what many correspondents, and unfortunately, by what many elected officials report to the news media, little understanding exists in our society in regards to the responsibility of managing disasters (Waugh, 2000). Along with the misunderstanding follows criticism, frequently from individuals ignorant of the functions of EMA. Such criticism was noted during the Hurricane Katrina disaster in the fall of 2005 (Balz, 2005; Cooper, 2005; Gibbs, 2005; Roberts, 2006; Stone, 2005), however it should be noted that emergency management responses had been criticized following Hurricane Hugo in 1989, disasters in California during 1990, and Hurricane Andrew during 1991 (Roberts, 2006). Disaster preparedness and management is first and foremost a local matter. Initial responders are going to be local resources for no other reason than proximity. If the situation is beyond local authorities’ means of management then state agencies become involved. Only when state agencies are overwhelmed does the federal government become involved unless the event is a criminal or terrorist act under federal
jurisdiction. The federal government does not have the authority to step in and take over at will (Waugh, 2000).

When a disaster strikes, FEMA must receive a written request for federal assistance from the state government. The written request must specifically identify the extent of the damage, and the resources that are needed. While Florida officials criticized the federal government’s response during Andrew of 1991, Roberts (2006) argues that a lack of specificity was provided, by local and state officials, when federal assistance was sought. Once a governor’s request is issued, FEMA then evaluates the information and situation. Following their assessment a recommendation is forwarded to the President of the United States. The President then makes a judgment to declare a federal disaster or not. If the decision rendered is in the negative the crisis must be handled at the local level. Unlike many other agencies FEMA is a relatively small agency employing approximately 2500 full-time employees. Moreover FEMA functions as an administrative agency by providing and guiding the assistance. The hands-on assistance is provided by local, state, private, and non-profit agencies (Waugh, 2000). As each new day offers us new opportunities each opportunity presents a potential for disastrous outcomes. Organizations need to be prepared for each new potential threat. Learning from our own and other peoples’ experiences is crucial in order to successfully meet the new challenges that face us.

From its early days, EMAs have experienced many transformations from the early civil defense days to the official formation of FEMA following the Three Mile Island nuclear accident. During the 1980s the Reagan Administration delegated flood prevention programs as well as disaster response. Additionally evacuation and warning against nuclear attack was a responsibility of the federal EMA. Also the 112,544 square-foot bunker under the Greenbrier
resort in West Virginia, assigned to house congressional leaders during a nuclear attack, was under the control of FEMA (Roberts, 2006). Following 9/11, FEMA underwent another reorganization with changes to the organization’s structure and function. The Homeland Security Act transferred all of the functions, personnel, and resources of FEMA to the DHS, with the exception of terrorism preparedness. The Office of Domestic Preparedness (ODP) was transferred from the DOJ to the newly formed DHS. While FEMA previously was the focus of grants, guidance and relations with state and local emergency management agencies, ODP assumed this new role (Jenkins, 2006). While Michael Brown, the former director of FEMA, has been widely criticized in analyses of the Hurricane Katrina response, he unsuccessfully argued against the movement of billions of dollars of preparedness grants as well as the national disaster response plan from FEMA to a separate agency with the DHS (Roberts, 2006). While the DHS was formed in response to terrorist attacks on 9/11, Hurricane Katrina prompted a reassessment of the National Response Plan (NRP). The assessment includes the roles and responsibilities of the federal government during a catastrophic event that overwhelsms and cripples the capabilities of state and local governments (Jenkins, 2006).

Prior to the creation of DHS, assets and organizations were scattered across more than two dozen federal departments and agencies and fifty state agencies (Wise and Nader, 2002). Additionally the federal government offered approximately 100 separate federal training sessions and sponsored more than 100 federal terrorist response teams under various departments and agencies. Some agencies, allocated funds to state and local agencies however had overlapping contingencies with the funds. An example of the overlapping responsibilities could be the anthrax outbreak following 9/11. Which particular federal agency the state and local agencies were to seek guidance from may have been confusing. A potential suspect was at one time a Fort
Detrick employee, so the DOD was one point of contact. Yet, at the same time, the FBI, the Postal Service, the CDC, and the HHS all were playing an active role in the investigation as well as managing the events. Following 9/11, FEMA shifted focus away from natural disasters towards development and management of terrorist activities. During the creation of DHS, FEMA lost its independent cabinet level agency status when transferred into the newly formed department. Additionally, grants awarded by FEMA to state and local agencies have changed to counterterrorism preparation from natural disaster preparedness and response (Schneider, 2005).

Problem Statement

Over several decades man made and natural disasters have devastated regions both domestically and internationally. Following the various catastrophes much has been written in both popular and peer-reviewed articles analyzing the governmental agency responses. Frequently the analyses are critical of various organizations responses to the disaster. Several authors have written extensively about adult education. Brookfield (1995) wrote about learning through critical reflection; Knowles (1984) authored the andragogical approach to adult learning; Cervero and Wilson (1994,1996) argued for responsible planning in adult learning and the power and practice for adult learners respectively. Learning is one of the key mechanisms that several authors (Fiol and Lyles, 1985; Garvin, 2000; Kim, 1993) argue, is central towards improvement of an organization's effectiveness. A problem is defined as an undesirable gap between and expected and observed state that hinders a worker's ability to complete his or her task (Tucker, Edmondson and Spear, 2002). Schwandt and Marquardt (2002), quote Albert Einstein as arguing that “no problem can be solved from the same consciousness that created it; we must learn to see the world anew” (p.16). Organizational learning is no longer an option as we enter the 21st century. Either we learn or we die (Schwandt and Marquardt, 2002). A number of
scholars have written extensively about the broad area of organizational learning theory and will be discussed in detail on page 30. While a limited amount of scholarly work demonstrates successful organizational learning (OL) activities in various industries (Daghfous, 2004; Fry & Goh, 2003; Griswold, 2003), Peterson and Perry (1999) demonstrated successful results when analyzing training activities within an EM agency. While a few dissertations were found, a review of the literature demonstrates a lack of empirical studies that address OL within an EM environment. However these studies analyzed large organizations versus a relatively small unit. Additionally these studies occurred in foreign governmental agencies whereas this study was conducted within a domestic organization (Cook, 2004; Corbacioglu, 2004; Cordoba, 2004).

While previous empirical studies of OL may be relevant to the organization of interest, Tsang (1997) urged caution when attempting to make generalizations about learning from one context to another. Furthermore a search of the literature demonstrates a lack of information regarding how coroners learn, as well as how they learn to prepare for disasters. This study helps fill the gap within the adult education and public administration literature in that it explores how coroners learn within their organization in their preparation for disaster management. The goal of this work was to seek to understand how OL is utilized within the context of EM; specifically a county coroner’s office was analyzed to evaluate theoretical models of OL. A county coroner’s office was selected as it provides a bounded unit that deals with EM. The main focus will be: how does OL improve the effectiveness of a county coroner’s office in its preparation for disaster management? What type of learning does the organization engage in i.e. single-loop type learning versus double-loop type learning? How does the organization engage in exploration versus exploitation in the learning of its members?
A central goal of this study was to understand how one particular entity involved in EM engages in learning in its preparation for disaster management. The study focused on a county corner’s office in the Northeast region of the country. The reason for selecting this office is that an in depth knowledge of a coroner’s office, a crucial component of any EM system, provides a unique opportunity for an exhaustive analysis of a single organization. Moreover my experience in a coroner’s office provides me with a deep understanding of the office, a fact that is central to this type of research (Mason, 2002). As a county coroner’s office functions as a unique entity within the broad spectrum of EM, a case study methodology was selected as it facilitates an in depth analysis of this bounded system.

OL is defined as a process that involves the acquisition, interpretation, meaning making, banking, and dissemination of information. The fields of OL and the learning organization (LO) have been contrasted within the literature (Easterby-Smith, 1997; Snell and Gherardi, 1998). While similar and occasionally confused with OL, an LO is a structure that facilitates learning within its boundaries. Fiol and Lyles (1985) argued that effective OL will improve the performance of an organization. This case study will analyze the level of OL within a county coroner’s office in its preparation for disasters. A coroner’s office is a sub-unit of a complex group of organizations that respond to disasters and function within a centralized Emergency Management Agency (EMA). A disaster is defined as when the resources of the individuals are overwhelmed. Learning is expected to be one of the key mechanisms through which organizations can prevent and minimize the impact of disaster (Carley and Harrald, 1997).

Research Questions

The purpose of this study is to understand how learning occurs, in the preparation of management of disasters and crises, in one particular case. The case will be analyzed through an
OL lens. One county coroner’s office has been selected for analysis within the interconnecting organizations involved within DM. A single county office was chosen to foster an in depth assessment of the agency. The study will allow for an understanding of the members experience in relation to learning and disasters.

The following over arching questions will be utilized to guide the study:

1. How does the Esson County Coroner’s office engage in organizational learning in preparation for disaster management (If it does)?

2. What type of learning does the organization engage?

3. How does the organization engage in (if it does) exploration versus exploitation in the learning of its members?

Subquestions:

1. Define your role in determining and planning learning activities within the Esson County Coroner’s Office.

2. Explain the evaluation process (es) of fulfilling the office’s learning objectives.

Conceptual Framework

The primary concept guiding this study of OL will be discussed in greater detail in Chapter 2. The concept of OL has been defined by several authors as a process (Argyris, 1999; Argyris and Schon, 1978, 1986; Fiol and Lyles, 1985; Garvin, 2000; Kim, 1993; Levitt and March, 1988; Nevis, Dibella and Gould, 1995; Schwandt and Marquardt, 2002; Senge, 1990). In other words the concept of OL requires action. OL is a process that Argyris and Schon (1978) describe as the detection and correction of error. Three types of OL have been defined by Argyris and Schon (1978) as well as other authors (Fiol and Lyles, 1985; Garvin, 2000; Kim, 1993; Levitt and March, 1988; Senge, 1990). Single-loop learning occurs when error detection
and correction allow an organization to continue within its present goals, norms, and policies. Double-loop learning occurs when the detection and correction of errors result in a questioning and modification of existing organizational norms, policies, procedures, beliefs, and routines. Single-loop is considered a lower level of learning while double-loop is considered a higher level of cognitive activity. Deutero-learning occurs when organizations learn how and when to execute single-loop and double-loop learning.

An LO is a structure that facilitates OL. Garvin (1993) defines an LO “as an organization skilled in creating, acquiring, and transferring knowledge, as well as modifying its behavior to reflect new knowledge and insights” (p. 71). Five characteristics of an LO include: 1) systematic problem solving, 2) experimentation with new approaches, 3) learning from their own experiences and past history, 4) learning from the experiences and past practices of others; 5) transferring knowledge quickly and efficiently throughout the organization. An LO is one that needs to move from its current state towards its desired state (Goh, 2003). Gardiner and Whiting (1997) debate whether an organization ever achieves that desired goal or is continually striving to achieve the aspiration. Hitt (1996) describes an LO as a paradigm, not of an end-state, but of a process. In order to accomplish the desired goals, planning and successful implementation of change is needed to improve the learning capability of the organization.

OL is described as a process where information is obtained, interpreted, banked into memory, and disseminated throughout an organization. Specifically Kim (1993) discusses this process as cyclical. Similarly, Handy (1995) describes OL as being in constant motion and utilizes a learning wheel as a model for the learning. The model is a four quadrant wheel that contains questions, ideas, tests, and reflection. The wheel begins in motion with questions. The questions then initiate ideas or answers towards a solution to the problem. Testing is conducted
on the ideas or answers to determine appropriateness to the question. Results are then subject to reflection to determine whether the solution is ideal or lacks completeness.

Handy’s (1995) wheel is relevant to both OL and DM. While Garvin (2001) argues that the stimulus to learn is survival, this preservation instinct can be the stimulus needed to begin the wheel’s motion when an organization’s members realize that they are no longer viable competitors. Handy describes this observation with competitors as institutional “voyeurism” (p.54).

The second quadrant of the wheel calls for the initiation of ideas from the members towards a resolution of the perceived problem. This quadrant has relevance for OL as members can seek solutions from within their organization (exploitive) or from outside sources (explorative) (Clegg, 1999).

Following the formation of ideas in quadrant 2, testing occurs to determine the relevance of the questions and ideas. The testing and formulation of questions are relevant to OL as questions can be analyzed by theories described by Argyris and Schon (1978) as single-loop or double-loop in nature. If organizations are attempting to solve a technical problem, the typology of learning would be described as single-loop whereas questioning the mission of the organization has been described as a double-loop.

The leader of the organization has been described by Handy (1995) as central to the success of the wheel. Similarly numerous authors call for the facilitation of leaders to actively encourage OL by its members by encouraging thinking outside the boundaries and creating safe environments that produce results that OL practitioners and scholars espouse (Dixon, 1999; Garvin, 2001; Senge, 1991).
CHAPTER 2

REVIEW OF THE LITERATURE

Introduction

Disasters can be manmade or natural in origin. A goal of emergency management is to adequately prepare for occurrences when resources are stressed beyond expectation. This chapter will review the literature on the organizational context of DM. The following section will then discuss OL followed with a subsection of the significance of OL and EM. The chapter will conclude with a review of the empirical studies of OL and DM.

Organizational Context of Disaster Management

Varied reasons exist that catalyze changes within an organization. Garvin (2000) argued that the need to stay competitive is the stimulus. Nathan and Kovoor-Misra (2002) identified a catastrophic event as the impetus for needed change. Organizational change is the deliberate and intentional strategic alteration of an institution (Cummings and Worley, 2001; French, Bell and Zawacki, 2000). Change can be noted by public school behavioral alterations such as those following the Columbine High School massacre where institutional lock downs became the norms, zero tolerance towards any perceived weapon is policy, and a societal awareness that one time pranks are no longer considered humorous. Parvis (2002) argued that the terrorist attacks of 9/11 were a wake up call for all Americans and that disaster planning is necessary. It was noted that "terrorist experts fear the probability of a surprise biological attack on any city is higher today than ever before" (p. 46).

While DM is relatively new to some organizations, such as public schools, hospitals have always had disaster plans as they were the one location to which casualty victims were transported. Events from Hurricane Katrina have demonstrated that additional plans must be
made if care providers and their institutions become the victims. Smaller scale medical facilities have undergone similar planning. At a minimum, all clinical offices and surgery centers must have a safety officer. This person may wear other hats (surgeon, operating room supervisor, office manager). This person's number one task is to "think through" and "create" their facility's responses to various disasters/emergencies. The need to stay competitive (Garvin, 2000) as well as stimulation from a catastrophe (Nathan and Kovoor-Misra, 2002), can be demonstrated by the need for back up plans, as was demonstrated by the Hurricane Katrina in New Orleans. Not only was the medical examiner's office overwhelmed by the number of casualties, the ability to manage the catastrophe was hampered by the elimination of all of the office's resources from the storm.

One aspect of DM that attempts to minimize the damage from overwhelming disasters, such as Hurricane Katrina, is adequate planning. Planning is the process of determining the ends to be pursued, and the means employed to achieve the desired outcomes. A planning model is a tool used to help understand and to bring order to a complex decision-making process (Sork and Caffarella, 1989). Carley and Harrald (1997) argue that planning is expected to improve performance through: insure knowledge of the strategy, providing practice and/or training that will foster higher performance during the actual situation, establishing a sense of ownership of the plan demonstrate a commitment to the plan, defining roles fosters more rapid response as these roles have been negotiated, and establishing communication and resource channels. Nathan and Kovoor-Misra (2000) identify organizational defensiveness as a reason that organizations fail to learn. Both top management and employees experience defensiveness as management attempts to limit damage to the organization. Employees display defensiveness to lessen their personal blame and culpability of incidences leading to the crisis.
Kartez and Lindell (1990) describe four causes that result in a local government’s failure to plan: the lack of relevant experience with disaster response, failure to learn from experience, a lack of commitment to carrying out a disaster planning program, and doing the wrong kind of planning. Carley and Harrald (1997) note that plans are often laid aside. For example during the Miami Hurricane of 1992, the Federal Response Plan was not followed. Practitioners were not the planners, felt no ownership, and in fact mostly did not read the plan. However Sork and Caffarella (1989) argue that direct participation of the client or learner is desirable, but inconclusive to suggest, that learner participation in planning enhances learning, motivation, or attitudes of the program. While a practitioner may not be a planner, it is the responsibility of the planner to determine whose interests he or she is negotiating for and to utilize his or her power within the membership of the negotiating team to accomplish their desired outcome (Wilson and Cervero, 1996).

As previously noted Kartez and Lindell (1990) identify failure to learn as one of the causes of failure to adequately plan for a disaster. Learning also may not occur due to events being one-of-a-kind events (Carley and Harrald, 1997) and unique (Kartez and Lindell, 1990). These events are situations that no one could have predicted and are extremely unlikely to reoccur. Examples such as this would be the Alaskan oil spill from the Exxon Valdez. Few people would expect an oil carrying vessel to run ashore due to an absent intoxicated ship captain. The second type of event is described as scalability (Carley and Harrald, 1997). These types of events are similar or identical to previous ones but much larger in scale. Examples may include a small flood in comparison to a large flood, or an airplane crash with 10 passengers versus 250 passengers. However 9/11, the Asian tsunami, and Hurricane Katrina have fostered stimulation among planners that the previously unthinkable can occur, and that adequate
preparation is required in order to exist. While many writers express opinions regarding planners’ and responders’ effectiveness, caution should be urged prior to labeling a disaster response as a failure or a success. Jenkins (2006) argues that when assessing success, corporations focus on profits since there is no comparable measurable outcome when assessing the DHS, nor is it easy to obtain a consensus on what the outcome measures should be and how the measurements might be used.

As previously stated, preparing for the unthinkable is required in order to effectively deal with the various potential disasters. History has observed events such as plagues, nuclear disasters, and tsunamis that have resulted in massive deaths. Concerns of another plague resurfaced following the discovery of the avian flu. Avian flu is caused by highly pathogenic avian influenza (HPAI) was first confirmed in poultry and humans in Thailand (Tiensin, 2005). Extrapolation of 1918-20 mortality rates to the worldwide population of 2004 indicates that an estimated 62 million people would be killed by a similar influenza pandemic (Murray et al., 2006). While pandemics may occur and are difficult to control, some events tend to be geographical and adequate preparations can be made. Tornados are most likely to occur in the midwestern or southern regions of the U.S. (Peek and Sutton, 2003). Pre-established underground shelters can alleviate possible death and injury.

Following 9/11, strong pressures were exerted towards a return of central command and control, both of which were inconsistent with shared responsibility and authority (Waugh and Streib, 2006). Additionally the focus on an all disasters organization was replaced with an emphasis on man-made events. While similarities exist, man-made hazards present some special problems for responders in comparison to natural disasters. Since 9/11 concern has increased over potential terrorist attacks involving the use of chemical agents. Several reasons exist that a
chemical agent may be unrecognized: symptoms of exposure to a chemical agent may mimic other common diseases; immediate symptoms may be non-existent or mild despite the long term effects; exposure to food, water, or consumer products may result in symptoms to medical providers over a long period and in multiple locations; persons exposed to more than one agent may display multiple symptoms; and patients may present to health care givers who are more familiar with common illnesses than to symptoms secondary to chemical agents (Patel et al., 2003).

Although many emergency functions are similar for each type of event, terrorist incidents require special attention because they usually generate mass casualties, potentially use exotic agents, and are known to attack both citizens and emergency responders and facilities (Perry and Lindell, 2006). Explosives are one tool used by terrorists. Two types of explosives used are either remotely controlled devices or suicide bombers (Benjaminov et al., 2006). Remotely controlled explosives were used within our country at the Murrah Federal Building in Oklahoma City, as well as at the Atlanta Olympics in 1996, while suicide bombers were observed on 9/11.

Injuries caused by blasts are divided into three categories: primary injuries, secondary injuries and tertiary injuries. Primary injuries are caused by the shock wave and movement of air passing through the body. Secondary injuries occur by propelled objects from the explosion. Tertiary injuries occur when victims are displaced and strike nearby (usually stationary) objects (Benjaminov et al., 2006).

Staff performance and decision making are greatly influenced if previous exercises and drills have taken place and if proper guidelines are established. However, staff must be prepared to handle a situation due to the fact that key personnel are frequently absent (or victims
themselves) when events occur and true events usually result in some displacement of available resources such as communication lines, traffic patterns (Benjaminov, et al., 2006).

Radiation as a weapon of terrorism focuses on the use of nuclear weapons, improvised nuclear devices, or radiological dispersal devices (RDD) (Burnham and Franco, 2005). RDD is the most likely weapon for terrorists due to its relatively simple technology and the widespread use of nuclear materials at industrial, research, and medical facilities (Burnham & Franco, 2005). Numerous reports exist of stolen industrial gauges that contain radioactive sources and are easily transportable. The radiation can be placed, and permitted to disperse quietly, or combined with an explosive to make a dirty bomb. The term dirty bomb is the combination of radioactive isotopes and explosives which spread the radioactive material over a widespread area (Burnham and Franco, 2005).

The CDC itemized five possible scenarios for radiation terrorism: nuclear weapon, improvised nuclear device, nuclear power-plant incident, hidden source of radiation, and dirty bomb. A nuclear contamination is the least likely, yet potentially most serious. In order for a deliberate nuclear event, a level of sophistication that few people possess, is necessary to carry out such an attack. Furthermore, nuclear facilities are protected significantly enough that the odds of a terrorist attack, resulting in failure within the cooling system of a reactor, is unlikely. However this event has the highest potential for catastrophic consequences. A nuclear blast moves away from the point of detonation at the speed of sound, and the thermal effects travel at the speed of light. The Strategic National Stockpile Radiation Working Group estimates that a 1-kiloton nuclear detonation in a city of 2 million people would result in >7000 deaths, 1000-3000 injuries, and >130,000 radiation fallout exposures requiring medical care (Burnham and Franco, 2005).
While some disasters threaten the personal safety of society, others jeopardize the reputation and function of an institution (Eden and Paul, 1996). Crises are harmful and disruptive situations of high magnitude that fall outside of an organization's typical operating framework. These events frequently threaten the survivability of the organizations. Crises can exist in many forms. The crisis may be technological such as the gas leak in Bhopal, the Exxon oil spill, or the space shuttle Challenger explosion. Crises may also be represented by employee violence such as USPS shootings, school violence such as the Columbine High School massacre, product defects by Firestone Tire Company, bankruptcy declaration by an institution such as Enron, or cheating scandals at academic institutions. Crises may prompt the desire for change and can be the stimulus for learning within organizations (Nathan and Kovoor-Misra, 2002).

Subsequent investigations of crises are a valuable source of learning within organizations. Without the felt urgency and subsequent motivation derived from the direct experience of a crisis, motivation tends to be lacking for learning. Some learning from crises occurs vicariously, in other words organizations learn from crises experienced by other organizations. Vicarious learning occurs through sensational ways or surrogate processes rather than from direct experience. Learning is derived from the observations of a model's performance rather than one's own experiences. The observer forms a cognitive or mental representation of the modeled behavior which serves as a guide for the observer's own performance. OL is the relatively permanent change in behavior (Fiol and Lyles, 1985). Four processes of vicarious learning include attention, retention, motor reproduction and motivation (Nathan and Kovoor-Misra, 2000).

Effective communication is needed to provide organizational members and the public with accurate information to prevent false rumors, limit convergence of well meaning
responders, and maintain a centralized authority system. Dangers are heightened when well
documented dynamics of behavior in disasters are ignored (Kartez and Lindell, 1990).
Inadequate information can result in catastrophic actions, a public relations nightmare, and
discredited organizational credibility, as was demonstrated by the West Virginia mine accident
where company officials, congressional representatives, and even the governor, announced
prematurely that miners were alive when in fact all but one were deceased (Carpenter, 2006;
Mitchell, 2006). Likewise, damage can be minimized by a well organized plan with accurate and
truthful information provided to the organization and public. This can be exampled by the
accolades showered upon former Mayor Rudolph Giuliani following the 9/11 terrorist attacks in
New York City. His handling of the situation resulted in being named Time magazine’s person
of the year and a nomination for the Nobel Peace prize. Former Pennsylvania Governor Mark
Schweiker also gained national fame for his physical presence and press briefings during the
televised successful rescue of nine coal miners in Somerset County (Gibb, 2002). Perhaps the
greatest handling of a crisis was the manner in which Johnson and Johnson managed the recall of
its over the counter pain reliever and instituted organizational changes when Tylenol bottles were
laced with cyanide in the Chicago area in 1982 (Birch, 1994; Foster, 2002).

While FEMA has been criticized during multiple disaster responses, it is important to
remember that state and local agencies play a vital role. In 1999, the federal government
initiated the Emergency Management Accreditation Program, in an attempt to certify states
abilities to respond to disasters. Since the original five states qualified, only two have since met
standards (Mortlock, 2006). Furthermore during the 2006 National Governors Association
gathering, six governors expressed an opinion that funding a major disaster is a federal
government responsibility rather than their own. Although every day a school in the U.S. has a

21
police, fire, or ambulance emergency, only one-half of the educational institutions have a written prevention plan for mass casualty incidents. Potential for disaster exists as schools have toxic cleaning supplies stockpiled in storage rooms, let alone mercury and radioactive materials in science labs which have been present for decades. Further potential exists in many citizens' backyards; and according to the American Society of Civil Engineers, more than 3500 dams are at risk within the U.S. While governors may look to the federal government for assistance as well as assuming the lead role in disaster planning, the general public has taken a lackadaisical attitude as well. Mortlock (2006) argues that public discourse has declined over the past 20 to 30 years. This is demonstrated by the lack of memberships in various civic organizations, as well as neighborhood networking, that once was commonplace in our society.

A lack of communication has been cited as a frequent criticism in disaster management responses (Roberts, 2006; Schneider, 2005). In particular communication between federal, state, and local agencies was criticized during Katrina. Road blocks exist in communication even at the executive level. One potential source of miscommunication is the fact that most governors lack the security clearances required to receive classified threat information. This absence potentially affects their ability to deploy the National Guard during crises. Likewise not all federal agencies agree on security clearances. While FEMA recognizes certain security clearances for local chiefs of fire and police, as well as local and state EMA directors, other agencies such as the FBI do not necessarily recognize the clearances (Wise and Nader, 2002).

As noted previously, disasters are EM events as well as political opportunities. Political ramifications must be taken into consideration when planning for disasters as leaders answer to different constituents, all of whom have different self interests. Wise and Nader (2002) note that officials at all levels may have some incentives to reach workable cooperative arrangements and
may anticipate blame for not doing so but “at the same time they will feel pressure to demonstrate individual leadership and seek to avoid blame when the threat of attack is raised again” (p.54). Wise and Nader (2002) argue that terrorist events simultaneously involve foreign affairs, national defense, criminal and public health events, all of which interact in countless ways. For example when state and federal laws are broken during a terrorist act, both federal and state prosecutorial agencies may indict the accused. However if the federal government chooses not to prosecute due to intelligence or diplomatic considerations, a state prosecutor may initiate proceedings despite the federal governments objections. Differing opinions and actions between state and federal agencies were previously witnessed. Then California Governor Gray Davis publicly ordered National Guard troops to guard suspension bridges within the state due to uncorroborated threats, despite the federal home land security leaders’ objections to the releasing of the information.

While failures in communication have been a frequent criticism of the 9/11 disaster (Kean et al., 2004) and Hurricane Katrina (Dearstynye, 2006; Wise and Nader, 2002), not all authors are critical. Tierney (2005) urges caution of criticism as communication has been a condemnation of every major disaster of recent memory. One must consider the number of emergency workers attempting to communicate via cell phones versus antenna based communicative devices during an event. The National Institute of Standards and Technology determined that 1/3 to 1/2 of all radio messages analyzed at the world trade center were incomplete or non-understandable (Tierney, 2005). Following 9/11 the NRP called for the Incident Command System (ICS) to be implemented during disaster responses. Tierney (2005) argued that the 9/11 Commission Report lack insight on manners to improve interference of desired results based upon interagency rivalries, OEM attempts at exerting leadership, or other
institutional and political factors. While many espouse the Incident command System (ICS) a lack of empirical evidence supports the effectiveness of the management style. Furthermore Tierney (2005) criticized the 9/11 commission for its lack of consideration to political, financial and cultural factors that contribute to response effectiveness. While the City of Los Angeles has long utilized the ICS system, a failure to recognize the cultural implications of a jury verdict, of police officers videotaped beating Rodney King, resulted in civil unrest for days within the municipality. Tierney (2005) also criticized the commission for a lack of acknowledgement of civilian response and education during disasters. Tierney credited (unlike the 9/11 commission) employees within the world trade center for recognizing the need and implementing evacuation procedures which may have resulted in the preservation of hundreds of lives.

Coppola (2005) argued that in cases of terrorism, fear is the greatest emergency that must be managed. Irresponsible or inadequate communication reports can enhance public risk. Former New York City Mayor Rudolph Giuliani was credited with frequent press briefings, updating and reassuring the public of events that had occurred, evacuation and management procedures to follow and measures that were being undertaken to provide further protection (Lakely, 2004). Current New York City Mayor Michael Bloomberg provided similar press briefings during the power outages during the summer of 2003 quickly alleviating doubts that the sudden loss of power was a result of terrorism (Semple, 2003).

While security clearances may hinder communication between agencies, health laws also hinder transmission of information. The federal Health Insurance Portability and Accountability Act (HIPAA) prevents the disclosure of identifiable information, however it does permit disclosure to public health authorities and permits disclosures when required by state laws. Once public health agencies have received the information, HIPAA no longer limits disclosure with
law enforcement personnel. In the event of biological or contagious epidemics, state legislatures have increased abilities to quarantine exposed or infected persons. Select states have written drafts that allow a governor to procure and maintain supplies from pharmacies, stockpile medicines and vaccines, distribute medications outside normal dispensing guidelines, order hospitals to cease other admissions and assign health care facilities for specific functions. The draft also allows a governor to initiate quarantine and isolation orders, deal with contaminated bodies and waste, provide crisis intervention for health care workers, and provide and limit information to the public. Additionally declaration of a disaster provides immunity to health workers from civil and criminal liability (Honssinger et al., 2005).

While laws have been updated based upon anticipated needs following 9/11, issues still exist for the various responders and disaster victims. Under normal conditions military are not used for civil matters domestically. If National Guard troops are activated, damages resulting from soldiers' actions during evacuation and commandeering are not necessarily entitled to compensation. Additionally, responders from neighboring states may not have benefits such as workers compensation/disability/life insurance in the event illness, injury or death ensue resultant to duties during the disaster response. Within the state of Washington, when Mt. St. Helens erupted, mandatory evacuations extended beyond the necessary geographical regions. Businesses who lost irrecoverable income sued unsuccessfully against the state as courts ruled that the governor's office acted reasonably (Honssinger et al., 2005).

While the federal government has been criticized widely for the mismanagement of Hurricane Katrina (Cray, 2005; Reid, 2005; Schneider, 2005; Wise, 2006), Helvarg (2005) argued that not all was a failure, nor was all of the blame due to the current administration. Points of criticism, as well as defense, of organizations are made. The National Hurricane
Center provided 72 hours warning of the pending storm and notes that the USCG made more than 6400 flood-water rescues in 4 days time. Helvarg (2005) did criticize FEMA’s response due to a previous staged flood plan that was based on a major storm and flood of New Orleans as well as the 1969 Hurricane Camille which was of similar force. He also did not accept the Bush Administration officials’ defense of themselves by arguing that no one had predicted that the levees would break, as the U.S. Commission on Ocean Policy highlighted the risk in 2004. In defense of the criticized Louisiana National Guard, he argued that the state military agency was overwhelmed, as well as hindered, by its own flooded headquarters. While Helvarg (2005) criticized the Bush Administration for the Army Corps’ funding cuts for levee work in 2004, Roberts (2006) noted that the levees had been neglected for decades.

As noted earlier, criticism was also due to previous administrations as well as the current. Former director James Witt scaled back FEMA’s national security role and left it ill-prepared to combat the emerging terrorist threat; in fact, he refused to accept increased responsibility for terrorism preparedness because the threat was deemed too unpredictable to address effectively. While FEMA has been widely praised for its rapid response to natural disaster during the 1990s, some of the acclaim was issued by individuals who received financial support following disasters. Furthermore a greater number of disasters were declared during the previous decade, including snow emergencies, when previous administrations refusing to declare the disaster status during winter storms. Regions which were politically competitive were rewarded disaster funds near election time, whereas regions which were considered political strongholds were denied (Roberts, 2006).

While disasters are catastrophic for victims, the events also serve as an opportunity for others. Crises are a valuable source of learning for organizations (Nathan, 1998). Three phases
of learning opportunities exist secondary to a crisis: defensiveness, openness, and forgetfulness. Both top management and employees experience defensiveness as management attempts to limit damage to the organization. Employees display defensiveness to lessen their personal blame and culpability of incidences leading to the crisis (Nathan and Kovoor-Misra, 2000).

Openness is demonstrated once the crisis has passed and management is amenable to exploring vulnerabilities and examination of the organizational performance of the crisis. Employees take clues from management whether open discussion is encouraged or whether scapegoating and punishment will likely follow. Forgetfulness results in part by the organization’s attempts to return to normal operations as quickly as possible. While the event may not be forgotten the sense of urgency that stimulates change in members dissipates, resulting in diminished interest in continued behavioral changes (Kovoor-Misra and Nathan, 2000).

Learning, however, needs not only to occur with individuals but must occur throughout the organization. OL is greater than the sum of its individual members. OL is a cumulative process that involves insight, action, dissemination and audit. Insight involves experience, mindfulness, and an attitude that errors are a learning experience, as well as an understanding that obstacles to learning are to be expected and anticipated. Similar to muscle building that requires action, learning also requires engagement. Learning requires experimentation, with an assessment of the trial and error attempts. Dissemination involves the determination of members in need of the new information, how best to transmit the knowledge and commit the data to organizational memory (Nathan and Kovoor-Misra, 2002).

Wise (2006), argued that the suboptimal performance during the Katrina hurricane was secondary to organizational management, policy, personnel, and political factors. However, the
hurricane Katrina federal response was not the first time the federal government's response was deemed inadequate. Following Hurricane Andrew in 1992, the Government Accountability Office (GAO) found the federal response to be inadequate in damage and needs assessments, miscommunication, unclear legislative authority, and unprepared, untrained state and local responders.

While criticism is rarely scarce following a disaster, a few authors provide specific recommendations for future improvements. Wise (2006) calls for homeland security to follow an adaptive model of management in the pursuit of disaster management. As has been noted disaster management encompasses federal, state, and local governmental agencies, quasi-governmental organizations, and non-governmental institutions all of whom have their own agendas, rules, and procedures. Within the adaptive model three rational processes have been identified: risk assessment, information feedback to decision makers, and adjustment of performance based on current information. Wise (2006) outlined conclusions for the implementation of the adaptive model for disaster management as

- defining and articulating a common outcome, establishing mutually reinforcing or joint strategies to achieve the outcome, identifying and addressing needs by leveraging resources, agreeing on agency roles and responsibilities, establishing compatible policies, procedures, and other means to operate across agency boundaries, developing mechanisms to monitor, evaluate, and report the results of collaborative efforts, reinforcing agency accountability for collaborative efforts through agency plans and reports, reinforcing individual accountability for collaborative efforts through agency performance-management systems,
involving nonfederal partners, key clients, and stakeholders in decision making (pp. 314-315).

Disaster preparedness must take into account the worst potential case scenario. Katrina has made people aware that a need to maintain open communication and to obtain and disperse accurate information is crucial in coordinating a disaster plan. Dearstyne (2006) called for organizations to back up files at a distant site; disperse data centers and duplicate electronic files; automate supply chains and logistics, mobile technologies i.e. laptop computers.

Gill (2005) called for organizations to undertake the following procedures to maintain functionality: development of internet infrastructure, continuity planning, organizational planning, risk analysis, logistics and tactics, communications, data backup, alternate facilities, physical security, preparation for unexpected opportunities.

Some sections of New Orleans area levees had been poorly planned and constructed (Roberts, 2006). Roberts (2006) called for EMAs to maintain focus on disaster response issues and leave intelligence gathering to law enforcement agencies. This is best exemplified by FEMA’s adventure into intelligence work during the 1990s and deemed homosexuals as security risks and attempted to compile a list of suspected males and females working within the agency.

Hultman and Bozmoski (2006) argued that long-range climate change mitigation efforts can augment societal resilience to acute and chronic natural hazards in the short-term and furthermore are an important aspect of national security. While Hurricane Katrina devastated New Orleans and the Gulf coast, significant burdens were placed on cities such as Houston, Texas and Baton Rouge, Louisiana when displaced citizens sought refuge within the receiving cities. The approach to disaster management includes enforcement of probable building codes and land-use regulations that safeguard against encroachments on the integrity of the ecosystems.
Hultman and Bozmoski (2006) also called for enhancing resilience by decreasing vulnerability to acute and chronic hazards such as diversified dependence on energy sources other than fossil fuels within a limited geographical region.

Brandsen et al. (2006) called for soft governance which is an approach to policy implementation where central government relies less on hierarchy than on information to guide local organizations. Brandsen et al. (2006) argued that dispersing guidelines over the organizations filed can raise the level of expertise and standards of performance without altering the regulatory performance. Because guidelines are not binding, room is left for innovative practice and successes can be forwarded through the centralized informational systems.

Burnham (2006) called for the creation of a standing fund to draw from to meet disaster needs immediately, sidestepping the present flash appeal process, which could speed relief and make for more effective intervention. During Hurricane Katrina donations fell short and the American Red Cross borrowed money for disaster relief, hoping that future donations would cover the debt.

Organizational Learning

Organizations continually need new knowledge to survive (Garvin, 2000). The concept of OL has been defined by several authors as a process (Argyris, 1999; Argyris and Schon, 1978, 1986; Fiol and Lyles, 1985; Garvin, 2000; Levitt and March, 1988; Kim, 1993; Nevis et al., 1995; Schwandt and Marquardt, 2002; Senge, 1990). In other words the concept of OL requires action. Schwandt and Marquardt (2002) defined OL as “a system of actions, actors, symbols, and process that enables an organization to transform information into valued knowledge which in turn increases its long-run adaptive capacity” (p.43). Garvin (2000) argued that “learning is a process that unfolds over time and links it with knowledge acquisition, deeper understanding,
and improved performance” (p.9). Fiol and Lyles (1985) defined learning as “...the development of insights, knowledge, and associations between past actions, the effectiveness of those actions, and future actions” (p. 811), and stress that “organizational learning means the process of improving actions through better knowledge and understanding” (p.803). Kim (1993) defined OL from a functional standpoint where learning “... is defined as increasing an organization’s capacity to take effective action” (p.43). For the purpose of this research paper, OL will be defined as the acquisition, interpretation, meaning making, banking into memory, and distribution of information.

While learning has been defined as a process, determination of an organization is equally important. Entities become organizations upon meeting three criterion: to have individuals make collective decisions (so that groups of individuals can say “we” in describing themselves), to delegate authority for action to an individual in the name of the collectivity, and to say who is and who is not a member of the collectivity (Argyris, 1999). Argyris (1999) argued that entities satisfy organizational status, when individuals who partake in the learning process, demonstrate desired learning outcomes, reflected by observable changes. Garvin (2000) stipulated that an organization has learned when it changes its activities in response to new knowledge or insight, typically resulting in improved performance. However, determination of process occurrence is not always clear. An organization may change, however learning may not be related to the adjustment. Hence an organization can downsize, salaried employees may work more hours, or productivity might increase and yet learning may not have occurred.

Argyris and Schon (1978) developed three theories that describe learning and behavior within an organization. Individuals operate by a theory of action which are methods developed based upon previous experience which determines appropriate behavior. People become
comfortable with their theory and tend to avoid experimentation and reflection. _Espoused theory_ is the theory that the individual claims to guide his or her behavior which may not be compatible with the theory-in-use, which is the actor's actual behavior. Organizational _theory-in-use_ is the observable actions that determine the groups' authentic organizational behavior.

Two distinct levels of OL have been described by several authors (Argyris, 1999; Argyris and Schon, 1978, 1986; Fiol and Lyles, 1985; Naot et al., 2004; Senge, 1990). Lower level learning (Fiol and Lyles, 1985), adaptive learning (Beck, 1997; Senge, 1990), single-loop learning (SLL) (Argyris, 1999; Argyris and Schon, 1978, 1986), and low-quality (Naot et al., 2004) frequently occur at entry level, low paying, and non-executive positions. The learning is based upon the supposition that the current level of knowledge is insufficient to solve a current problem. Learning is short term, involves minimal cognition, and is non-challenging of the organizational norm. Frequently, the problem controls the workers in lower level learning environments. Contrarily in higher level learning environments the workers attempt to control the problem and alter the situation to seek long-term resolution. More advanced styles of OL have been described as higher level (Fiol and Lyles, 1985), generative (Senge, 1990), proactive (Beck, 1997), double-loop (DLL) (Argyris, 1999; Argyris and Schon, 1978, 1986), and high-quality learning (Naot et al., 2004). These advanced styles of learning challenge rules and norms, attempts to liberate oppressed workers, and question the overall mission and objectives of an entire organization. Furthermore, Naot et al. (2004) argue that the distinction between lower and higher level can be made based upon Argyris and Schon's (1978, 1986) normative framework of learning, in which the two styles are differentiated, with the latter viewed as effective, productive, or valuable.

Organizational learning as previously noted is the detection and correction of error. Error
detection is frequently stimulated from an external source (Argyris and Schon, 1978; Dixon, 1999; Pedler, Burgoyne and Boydell, 1991) and at other times, internally (Lam et al., 2002; Marsick and Watkins, 1996). When correction occurs within the organization’s present policies and norms, the process is labeled as SLL. Argyris and Schon (1978) symbolize SLL with a thermostat that reacts to sensations of heat and cold, with resultant action, until a desired equilibrium is obtained. DLL occurs when error is detected and corrected in ways that involve the modification of an organization’s underlying norms, policies, and objectives. Most organizations utilize SLL well, but experience difficulties and resistance to DLL.

While these two models may seem binary, learning does not necessarily model one loop at the exclusion of the other. The aspects or values of DLL include valid information, free and informed choice, and internal commitment. The behavior strategies of DLL include sharing power with competent members who are relevant in deciding and implementing the action. Within this DLL model the actors strive to obtain the most competent members for the decision making and build networks which make the function of the group maximize the contribution of each member (Argyris, 1976). SLL occurs when matches are created or mismatches are corrected by changing action. DLL occurs when mismatches are corrected by first examining and altering the governing variables and then the actions. Governing variables are the preferred states that individuals strive to fulfill when they are acting. The variables are not what the actors espouse but rather are inferred by observations of the actor’s behaviors (Argyris, 1999).

Significance of Organizational Learning and Emergency Management

While many theories about OL have been written (Argyris and Schon, 1978, 1986; Beck, 1997; Fiol and Lyles, 1985; Garvin, 2000; Kim, 1993; Levitt and March, 1988; Nevis et al., 1995; Schwandt and Marquardt, 2002; Senge, 1990), empirical studies that support the theories
are rather limited. One difficulty in examining theories of OL is the determination of whether or not OL has in fact occurred. While a new program could be instituted within an organization, the members could be tested either verbally or via written examinations to determine whether the information has been obtained or not. While cognitive gains are important within OL, cognitive advances may not be adequate support for the determination that OL has occurred. Argyris and Schon (1978) argued that OL is the correction of error and Garvin (2000) called for the relatively permanent change. Both of these theories have a behavioral component in the determination of OL occurring. Naot et al. (2004) noted this behavioral component within their study of the Israeli military study. While it was demonstrable that the military had made strides in the detection and prevention of error by training soldiers, fatal errors continued to occur within the ranks of enlisted members. It could be argued that OL had not taken place as behavioral changes were not observable.

Furthermore, few empirical studies support the theories of learning within the professions of emergency management. Peterson and Perry (1999) analyzed professional firefighters via surveys before and after training exercises. While their study demonstrated favorable perceptions regarding teamwork, planning adequacy, training adequacy, response network effectiveness, equipment adequacy, and job risk, one could argue that OL may not be demonstrable as behavioral changes had not been exhibited as called for by Argyris and Schon (1978) or Garvin (2000). McEntire’s (1999) analysis of Hurricane Georges in the Dominican Republic demonstrated few examples of OL. Many organizations were ill prepared to handle a disaster, or underestimated the magnitude of the supplies needed, due to inadequate shelter preparation; impromptu shelters were a norm but inadequate for the evacuees needs, and too

34
little attention was paid by the executive level of government when the impending storm was expected.

Empirical Studies of Organizational Learning

While theoretical models have been identified, studies have been conducted that demonstrate many of the espoused theories by the model authors. Goh (2003) analyzed two companies over a two to three years duration based upon his five strategic blocks. Lessons learned from two case studies: 1) focus on mechanisms such as structures and management practices that are practical for the organization to implement in order to enhance its learning capability; 2) conduct an internal diagnosis and benchmark the organization to motivate and unfreeze the organization to provide a direction for change; 3) develop a change process that ensures the principles and practices of a learning organization become a part of its culture and operations; 4) engage a small operating unit within the organization who supports the learning program to serve as a learning platform for other units; 5) identify a group of employees at all levels who strongly support the concept of a learning organization; 6) use these employees as agents of change by providing the necessary infrastructure; 7) recognize that successful implementation requires two-three years of time for successful implementation. Members expressed a need for solutions to become a norm within the organization not just a one time problem fix.

Fry and Griswold (2003) analyzed an LO concept implementation attempt within a public organization. Their results found that 1) employees were eager to acquire information yet frugal with its distribution, 2) a longer duration for implementation was needed than was initially anticipated, 3) grand strategies were less successful versus small incremental steps. Multiple reasons exist for the participants' lack of satisfaction within the study. A sense of an additional
task to complete versus an organizational improvement activity (lack of vision) resulted in participant resistance, as did participants’ expected enthusiasm and cooperation from facilitators. Also identified were different perceptions in the “performance gap” of higher administration versus front line workers. While external sources (Argyris and Schon, 1978; Gardiner and Whiting, 1997; Lam et al., 2002) have been cited as stimulation for learning, less than one-third of the participants felt that outside sources resulted in learning.

Naot et al.’s (2004) findings support some of the recommendations for the facilitation of OL. In particular the authors recommended the active engagement of the members within the learning process. Leadership style unlike management (Hellriegel and Slocum, 2004) was also noted as an important determinant of OL. However, it should be noted that this study was an Israeli military organization. As noted by (Tsang, 1997), caution must be exercised when attempting to generalize from organization to organization and culture to culture.

A defense company in the United Kingdom underwent major changes in an attempt to survive the current economic climate. Changes were those espoused by learning organizations: shared vision, cross training, empowerment, and experiment without punishment (Gardiner and Whiting, 1997; Garvin, 1993, 2000). Based upon follow-up studies, the conclusions identified that: 1) loyalty is a two-way street, reciprocity from employer is needed for employee commitment, 2) employees need a sense that vision is shared and that they have a voice. While a majority felt that the quality of work was high, information was shared, and atmosphere was generally supportive, a lack of skill sharing was noted and employee suggestions were felt to have been ignored. Less than half of the participants felt that they had a voice in policy development.
Coad and Berry (1998) examined both learning styles and leadership styles in relation to OL. Learning styles have been identified as either performance oriented or learning oriented. Learning oriented individuals view themselves as innately curious, willing to take risk, unintimidated by mistakes, with a belief that their personal qualities and abilities are malleable. Performance oriented individuals tend to shun experimentation, view ability as a fixed entity, and fear negative evaluations.

Leadership styles have been described as transactional or transformational. Transactional leadership involves role clarification, distribution of rewards and retribution based upon performance. Initiation of action is reserved for evidence of failure of results according to plan. Transformational leadership involves the arousal of heightened awareness of key issues of the organization and stimulates individual interest and pursuit of new ideas to meet the institutions objectives and mission. Members are encouraged to experiment, permitted to err, and facilitated to think outside of the box (Coad and Berry, 1998).

An empirical study of accountants in the United Kingdom demonstrated that a desirable leadership style resembled the transformational versus transactional, and a desirable learner style mimicked a learning orientation versus performance direction (Coad and Berry, 1998).

Daghfous (2004) conducted a case study of technology transfer between a university and a private industry and noted that members of the organization were too busy in their day-to-day operations to engage in experimentation. He also found that other groups within the organization such as accounting and marketing needed knowledge of a new technology system, due to competitive testing and compensation packages as well as anticipation of customer needs. Hence, this study supports theoretical models of inter-organizational communication. Small group improvement activities allowed for members to improve upon core competencies of the
new technological knowledge, as well as cross train. One unintended result of the technology transfer project between the private company and the research university was improved communication that resulted in additional projects with several other university departments.

Tucker et al. (2002) argued that OL is hindered when problem solving behaviors are focused solely on short-term solutions instead of seeking of long term solutions by the removal of the root causes of the problem. Their argument was based upon a qualitative observational study of nurses within a health care delivery context at eight different hospitals. During the study of 197 hours of observation, a nurse encountered a problem every 1.6 hours. Two causes of first order problem solving were a lack of time for second-order problem solving due to a demanding work load and a lack of status in comparison to physicians and managers.

De Weerd-Nederhof et al. (2002) utilized a case study methodology to analyze ten multinational organizations who participate in research and development as a regular part of their daily function. In particular, their study focused upon the context contingencies between organizations operating in diverse industries, testing the functioning of the organizations based upon the objectives and constructs of the theoretical literature of OL, and providing a focus for further in-depth investigations. Their study indicated that pre-planning activities were one of the strongest tools that fostered OL. Pre-planning activities included outlining the project process which identifies the tactical knowledge of the project and provides the opportunity for discussion and consensus of the project. The case study also found that while the organizations have a post-project review procedure, few utilized the process due to a stated lack of time. The case study was analyzed by Huber’s (1991) learning processes. While Huber described a sequential learning process, this study found a non-sequential learning process existed. Additionally,
organizational memory played a larger role in the organizational learning process than anticipated.

Petts, Herd and O’heocha (1998) analyzed small and medium sized organizations to assess whether elements of OL can be utilized to translate attitudes concerning the environment into effective behavior. Specifically the focus of the study was interested in the relationship between organizational members’ personal attitudes concerning the environment and the effect on corporate managers’ behavioral response. Of particular interest were the non-management members’ attitudes and the effect on the corporate response. Twelve companies that had the potential for pollution were examined through a process of survey questionnaires, exploration and confirmation with six focus groups and semi-structured interviews with members of each company. Results demonstrated that a strong leader regarding the environment was the key to the implementation within each company versus individual members assuming an active role. However the individual business’ benefit was the primary motivation for behavioral changes regarding the environment. Additionally management members responses tended to state a positive environment towards an environmentally conscious corporation and for OL, while non-management members were less positive in their responses.

Holmqvist (2004) evaluated exploitation and exploration within an organization that produces software and between its consumer smaller business partners. While some authors have posited that exploration and exploitation may be polarizing concepts, this case study supports that both processes are used for OL and that dissatisfaction of results based upon one concept initiates the activation of the other. Furthermore this case study finds that the generation of competence does not necessarily result in “traps” that have been identified by Argyris and Schon (1978).
Van Deusen and Mueller (1999) analyzed organizations within the hospitality industry for their usage of exploration and exploitation during the acquisition process. The study undertook a case study approach combining quantitative research as well as qualitative interview, observation and archival techniques. Due to a limited number of resources actors were forced to choose between exploration and exploitation. Firms that had relied excessively on one versus the other were unsuccessful. Their results demonstrated that a combination of exploration and exploitation was beneficial. The authors hypothesized that organizations that were successful would rely on exploitation while unsuccessful organizations would rely on exploration. Although statistical results did not support this hypothesis, the qualitative data yielded evidence to sustain this supposition. Additionally, the case study demonstrated a negative correlation between new members and exploitation as well as a positive relationship between new members and exploration.

*Empirical Studies of Disaster Management*

As noted previously, much has been written in the field of emergency management and disaster preparedness, yet few empirical studies exist that support the calls for preparation. Eden and Matthews (1996) evaluated public, academic and special libraries in the United Kingdom for their plans for disaster management and preparedness. Their results found that confusion exists as to who should be the sought after experts to provide advice on developing their plans. For example a local fire department can provide information on building codes for fire safety and for adequate escape mechanisms. However, the fire department may have little interest in the preservation of valuable or historical documents, which is the main function of a library. Another finding was that many libraries still store their most valued pieces in basements which are susceptible to flooding, dampness, and mold. Furthermore valued objects tended to be
stored in the least accessible locations to attempt a rapid rescue and recovery of the treasures. The study also found that most people involved in previous disasters, found recovery time greater than anticipated. While it is common for co-workers to experience grief with the loss of fellow workers, this study also found that custodians of valued collections develop an emotional attachment to the objects and may experience a sense of loss when collections are lost, which can foster impairment.

Following the disaster of Hurricane Georges in the Dominican Republic, McBride (1999) analyzed the disaster to determine if 1) Practitioners have overcome obstacles to effective and efficient relief identified in previous disasters, 2) What problems remain, and 3) What are the solutions to those issues which have not been resolved. He found that progress had been made in the immediacy of disaster declaration, the distribution of appropriate and usable aid, a higher degree of co-ordination among humanitarian actors, increased experience and training of relief workers, and the integration of humanitarian assistance and development. Problems that remained were determined to be an over-all inadequate disaster preparedness, scarcity and distortion of disaster related information, difficulty of assessing victims' needs, and an exaggeration of relief requirements. Further deficiencies include an insufficient amount of aid, an unjust distribution of disaster assistance, the disadvantages of centralization, a distrust in emergency managers, and the challenge of avoiding dependency. Solutions recommended were making disaster preparation a priority, gaining and distributing disaster information, accessing all disaster sites and carefully assessing needs. Additional suggestions include meeting and monitoring relief requests, stretching relief resources, addressing political issues in disasters and providing relief to non-government organizations, expanding the non-government organization, increasing the number of relief participants, as well as enhancing the accuracy and distribution of
information and relief. Two significant findings of this study were the importance of educating
the public and the need for preventing disasters.

While Eden and Matthews (1996) examined libraries for their preparation for disaster and
McEntire (1999) analyzed the response to a specific disaster, very little quantitative research has
been conducted in the field of DM. In particular, little empirical evidence exists that
demonstrates beneficial outcomes to disaster preparedness. Peterson and Perry (1999) conducted
a quantitative analysis of reactions of participants in two separate training exercises. The first
exercise was a mock hazardous materials accident at an industrial firm and the second was a test
of medical triage of mass casualty events. Based upon the literature the authors posited that 1)
participants would perceive higher levels of teamwork, 2) participants would perceive higher
levels of response network effectiveness, 3) participants would perceive higher levels of training
adequacy, 4) participants would perceive higher levels of planning adequacy, 5) participants
would perceive higher levels of equipment adequacy, 6) participants would perceive lower levels
of job risk. In the hazardous materials exercise the perceived higher levels of teamwork, higher
levels of response network effectiveness, higher levels of training adequacy and higher levels of
planning adequacy were statistically not significant, while equipment adequacy and lower levels
of job risk were statistically significant. Within the mass casualty triage exercise the perceived
levels of teamwork, network effectiveness, training adequacy and equipment adequacy were all
statistically significant.

While empirical studies have been conducted for disaster preparation, several disasters
have occurred within the last 20 years that have fostered post disaster analysis both foreign and
domestic. In the 1995 Tokyo subway attack, sarin gas was released during peak travel time
resulting in 12 deaths and 5500 persons injured. Analyses (Okumura et al., 2005; Tokuda et al.,
2006) resulted in similar conclusions for future disaster responses. Of the 1364 fire department personnel who responded, 9.9% experienced secondary exposure during transportation of the victims to emergency facilities and 23% of hospital staff experienced secondary exposure due to a lack of decontamination of the victims at the scene. Lessons learned from this attack include usage of personal protective equipment (PPE) by rescue personnel when a gas is suspected and proper decontamination at both the scene and at the emergency department prior to the placement of victims within the building. Prevention of secondary exposure will be difficult due to the initial wave of victims arriving by private vehicle to an unsuspecting emergency department. Decontamination is described as either wet or dry. Dry decontamination calls for the removal of clothing where as wet decontamination is the washing down of the body with water. Wet decontamination is called for when contamination is observed with the naked eye or if blister formation is observed (Okumura et al., 2005).

Similarly Tokuda et al.’s (2006) analysis following the sarin nerve gas attack in Tokyo, demonstrated that 20% of emergency department resident physicians and nurses suffered secondary exposure symptoms while 9.9% of the EMTs transporting the victims suffered similar symptoms. The authors called for increased awareness of responders of the basic characteristics of a nerve gas attack. Pre-hospital triage should be initiated to prevent the overwhelming of individual hospitals and to prevent the secondary exposure casualties. An information center should be established as soon as a nerve gas is suspected to inform the public through the media. This fosters a more rapid spread of information and alleviates the need of hospitals from communicating with the public as well as other hospitals.

A quantitative and qualitative case study was conducted in Turkey of the response to five earthquakes that occurred between 1992 and 1999. The study focused upon organizational
learning and self-adaptation in dynamic disaster environments. Following the first three earthquakes a linear pattern of learning was observed that resulted in single-loop type learning that was deemed to be insufficient to responding to the needs of the victims. Following the fourth earthquake that resulted in >18,000 fatalities, changes were made that challenged the way that infrastructure was designed for organizational capacity. The changes included, inter-organizational coordination, emergency planning, professional personnel and reserves, and emergency communications, technical capacity. Technical capacity includes information infrastructure, emergency operation center and resources, implementation of earthquake codes, and cultural capacity which encompasses learning from experience, learning and self-adaptation during response operations. The changes made were deemed reflective of double-loop learning (Corbacioglu and Kapucu, 2006)

Following the tsunami of 2004 three countries, Thailand, Sri Lanka and Indonesia were examined from the standpoint of fatality management as each country suffered significant deaths, 8,345; 35,399; and 165,708 respectively. Management of the bodies was significantly impaired due to the hot and humid environment of the regions, in addition to the infrastructure damages caused by the storms. Of the three countries no single agency was responsible for the management of the deceased residents. Based upon the interviews with the available members who spent at least four weeks with the fatality management teams, the following observations were made. From a health standpoint the risk to the general public with large numbers of dead bodies is negligible in comparison to common belief and frequent media reports. Drinking water must be treated to avoid diarrheal type illness; however no other significant illnesses were reported based upon the drinking water. Body handlers should follow universal precaution for blood and bodily fluids; however other than sharp object puncture wounds or fluid splash from
the bodies no other significant illnesses were reported. Body storage is ideally performed through the usage of refrigerated containers; in mass disasters where thousands of bodies are present, temporary burial in trench graves can be used. Since identification of bodies may prove difficult due to limited DNA, dental radiographic equipment, and clinical expertise of qualified medical examiners, photographs should be taken of the fresh bodies as soon as possible for later visual identification from family members. If conditions are such that a communal grave is required, bodies should be buried in one layer, each site clearly marked, 1 meter below ground surface to facilitate future exhumation. A single organization should be mandated to coordinate the management of the deceased bodies. Close workings with the media to disseminate accurate information and promote the rights of survivors to have their dead treated with dignity and respect (Morgan et al., 2006).

While foreign disasters and catastrophes have been analyzed for response effectiveness, domestic events have occurred and been both praised and criticized for various agencies responses. Following the attacks upon the WTC in 2001, the New York City Fire Department evaluated their response to the disaster. Communication was deemed a significant problem for both the responders and the communication centers. Exchanges were impaired during the 9/11 response by the FDNY as radio transmissions to units within the building were not confirmed so communication centers were uncertain that instructions were actually received. Additionally individual radios did not receive or transmit while in side the buildings and left rescuers unaware that an adjacent building had collapsed. Responding units that were located within tunnels were unable to receive transmissions from command centers, resulting in unawareness of updates and missed assignments from chief officers on the scene (FDNY).
The fire departments post disaster analysis also found several other problems. Difficulty existed as to which members where missing as each truck and officer is required to have a list of on-duty firefighters per unit. However, several vehicles were destroyed during the building collapse as were the officers of each vehicle, thereby rendering the identities of the responding members uncertain. Further confusion existed as the alarm arrived near the change of shift time so both off-duty and on-duty firefighters within several units responded, further complicating the number and identity of missing or unaccounted for rescuers. Attempts to maintain control was further complicated following the collapse of one of the towers that resulted in the deaths of several chiefs and staffers of the command center. While incidence of confusion from well intentioned civilian responders has been reported (Waugh, 2000) several reports existed of firefighters not initially assigned to the scene requesting (and berating dispatchers) and/or responding despite a lack of assignment from central dispatch (FDNY).

While much attention is paid to the site of the WTC collapse, suburban Virginia was the site of attacks which required the response of D.C. area emergency providers. The Pentagon was attacked by a 757 airliner striking the building at approximately 400 m.p.h. causing a fiery five story collapse resulting in the deaths of 189 people (Collins, n.d.). While after activity analyses tend to be critical of performance, the response to the Pentagon attacks were viewed as successful in part due to the relationship of the various members of the management level of the disaster team. The chief of the Fairfax County Fire and Police Departments, as well as the special agent in charge of the FBI, commanding general of the military District of Washington, and Arlington Police Chief were on a first name basis. The fire chief upon arrival initiated the ICS and established a unified command system due to the previously established plans and relationships. An example of the success of the Pentagon attacks response, due in part to the pre-
established relationships and guidelines, were the assignments accepted by the various responders. The ACFD commanders told the Fairfax US&R staff that the fire department, EMS, and hazardous materials operations would handle the relevant operations and that the US&R staff should handle the search and rescue operations. This fostered a lack of overlap of similar tasks by several different entities and provided a safer environment as US&R has team members who are structural engineers who could evaluate the safety of a structure and make recommendations prior to the entry of rescuers. Not knowing the possible chemical agent contamination members of the National Medical Response Team (NMRT) were present and decontaminated each member upon exit from the damaged structure (Collins, n.d.).

The attacks of 9/11 have fostered a reassessment of responders’ needs, duties, and training. This reassessment has facilitated the consideration of using FEMA US&R teams for disasters, which were not anticipated, because of their skills at the time of the teams’ inception. Terrorism was not high on the list of needs when the teams were formed. Since viewing the success of the teams, their usage for other disasters requires consideration (Collins, n.d.). While US&R have been designed for building collapse all eight federal task forces of US&R have been equipped and trained for flood rescue operations. In fact Pennsylvania’s US&R team has participated in rescue operations of hundreds of victims during flooding following a hurricane (Collins, n.d.). Even though the rescue teams were originally designed for building collapse rescue, more commonly seen in earthquakes and tornados, within one hour of the attacks of 9/11, FEMA activated 16 urban search and rescue (US&R) teams. Twenty-eight US&R teams exist throughout the country, each of which consists of 39 members.

Peek and Sutton (2003) analyzed the 9/11 attacks based upon Quarantelli’s (1993) classification of crises. Crises have been described as either consensus-type or conflict-type
crises. Consensus-type disasters are usually natural or technological in nature, sudden in appearance, and have a fairly definable locality and area of impact. These events normally result in the creation of widespread public consensus and focus on terminating the crisis and striving towards the return of normalcy. In contrast conflict-type crises are events where one or more parties intentionally and consciously inflict damage, destruction, or disruption to a population of people. Examples of consensus-type crises would be hurricanes, floods, tornados, forest fires, mud slides, etc. Specifically the July 2004 tornado of Campbelltown, PA and Hurricane Katrina would example consensus-type crises. Conflict type crises would be mass shootings, terrorist attacks, or riots. Specifically the 1999 Columbine school massacre, the 9/11 attacks on the WTC and Pentagon, and 1992 Los Angeles riots would example the conflict-type crises.

Quarantelli (1993) identified several behaviors based upon the type of disaster that has occurred. Proposition one states that 1) individuals react actively and with pro-social mode when disasters occur and display variability of anti-social behavior following riots; 2) disasters do not appear to have many lasting behavioral consequences, while riots seem to have a longer lasting residue; 3) organizations have difficulties managing crises but have even greater difficulty managing disaster due to riots; 4) there is selective organizational change that can come from undergoing a community crisis but is far more likely after riots than after disasters; 5) community preparations for disasters and riots are different in that response to terrorism necessitates additional measures given the obscure and ongoing nature of the threat; 6) there are some selective but different long-run outcomes and changes after disasters and riots in impacted communities although the surfacing of negative aspects occurs in both.
Proposition 1
Following the attacks of 9/11 there have been significant strides made across the U.S. for disaster preparedness. While the attacks of 9/11 were of the conflict-type crises, the response from organizations and public resembled a disaster type response. Responses from the public were massive as was demonstrated by the long lines of blood donors and volunteers from various walks of life who offered assistance as well as donated food, water, clothing, money and supplies. Despite the common myth that disorderly behavior follows conflict-type crises as was noted in the 1992 Los Angeles disturbance, little of the behavior existed on 9/11 (Peek and Sutton, 2003).

Proposition 2
Following the 9/11 attacks residents living within the greater metropolitan New York area had an 11.9% higher incidence of symptoms consistent with post traumatic stress disorder. It also has been established that first responders experience a greater incidence of PTSD than the general population particularly following man-made events in which multiple mangled and dismembered body parts exist. Upper respiratory symptoms have been widely reported in those who were on the site of the WTC. In fact a nickname World Trade Center Cough has become a label due to the number of reports of symptoms of those who were not present even the first day of the attacks (Peek and Sutton, 2003).

Proposition 3
Organizations normally have a longer time managing crises when they are man made versus natural disasters. During 9/11, communication was hampered by the magnitude of the events over several sites, as well as the long term recovery due to the need for multiple agencies, both public and private. Also, from a federal standpoint, the events were occurring over several states
with multiple reports arriving some of which were inaccurate i.e. news reports that the state
department was under attack. Decision making was also hampered as the emergency operations
center was located within one of the towers and resulted in a loss of some of the chief officers.
The damage required a relocation of the BOC. Interagency workings were hampered due to the
Pentagon and WTC being crime scenes, as well as disaster sites, where access and security
limited the flow of would be rescuers (Peek and Sutton, 2003).

Proposition 4

Organizational change is more likely following disasters that are man made versus natural in
origin. This change is demonstrated by the rapidity with which a normally slow and deliberative
Congress approved funding for legislation, without hearings or investigations. The Congress
passed a now controversial Uniting and Strengthening America by Providing Appropriate Tools
Required to Intercept and Obstruct Terrorism Act of 2001 (USA PATRIOT act). Additionally
the legislators transferred airport security to the newly formed transportation security
administration under the transportation department from under the Federal Aviation Association.
Additionally, the Senate passed the development of the Homeland Security Department by a 90-
9 vote combining 22 federal agencies, resulting in the largest federal government reorganization
since the creation of the Department of Defense in 1947 (Peek and Sutton, 2003).

Proposition 5

US&R teams drove from Tennessee to the Pentagon site to aid in the search and recovery
process (Collins, n.d.) In addition to the federal, state and local agencies that responded, faith-
based and community-based organizations responded. Bystanders and civilians responded to aid
in the immediate rescue and evacuation, as well as the immediate recovery operations, and even
during ensuing days. Normally in a conflict crisis, bystanders flee to avoid potential bodily
injury. Following the 9/11 attacks, there was a rush to return to normalcy even though an uncertainty existed as to the potential for future attacks. Additionally hampering rescue and recovery efforts was that the WTC and Pentagon were not only disaster sites but crime scenes. Significant control to access of well intentioned volunteers was necessary (Peek and Sutton, 2003).

Proposition 6

There are selective, but different, long-run outcomes and changes after disasters and riots in impacted communities, although negative aspects can occur in both. Some negative consequences have been observed already such as the disagreements whether or not to rebuild on the site of the WTC. The negative impacts have been significant financially for some members of the private sector. Many businesses were lost and an estimated $83 billion were lost as a result of the disaster with 100,000 people suffering job loss (Peek and Sutton, 2003).

The city of New Orleans sits seven feet below sea level on sinking clay soils with the Mississippi River and Lake Pontchartrain surrounding the city. The city has been kept dry from a system of levees and pumps that were designed and installed in the late 1920s to 1930s. The levees were designed to withstand a Category 3 hurricane, however the city was hit with a Category 4 storm. Approximately eight hours following the hit, the 17th street levee breached, allowing the lake water into the city. Comfort (2006) argued that the city was hit with two disasters, one was a natural storm the other was the product of unintended human design. Although the deteriorating conditions of the levees were well known, little was done by federal, state, local, or private agencies and citizens, to commit to the expensive upgrades of the levees. Computer models demonstrated that the levees would fail even from a Category 3 hurricane.
While much attention is given to the victims of disasters, and thoughts frequently pertain to trauma and illnesses due to biological or chemical agents, little discussion has been given to uninjured but displaced victims. Currier et al. (2006) analyzed a response to Hurricane Katrina in Jackson, MS. Due to the influx of emergency department patients, the realization became apparent rather quickly that many displaced victims were uninjured, yet had no capacity to deal with their routine medical needs. While the Red Cross offered medical care for injuries, provisions did not exist to provide for other medical needs. The University of Mississippi Medical Center established a clinic within the Red Cross shelter in an attempt to alleviate the emergency department from non-emergencies. As many persons were displaced from their homes, routine medications for chronic conditions such as asthma, diabetes, hypertension, and angina were going untreated. The clinic provided medications for those who needed them with the assistance of local pharmacies. In a 17 day period the temporary clinic provided 2394 clinic visits and filled more than 4902 prescriptions. The authors concluded that, while care needs to be provided for injuries sustained within disasters, provisions must be made for the care of chronic conditions of those who are displaced from their normal support systems.

Similarly an analysis of two out-of-state disaster response teams over two concurrent days of treatment was conducted retrospectively. While one team was located in New Orleans the other was assigned to Gulfport, Mississippi. The temporary clinics were open six hours per day in tents. A total of 501 patient encounters were recorded then later analyzed. The most common presentations were for chronic health conditions and not for injuries sustained from the hurricane. The most common presentation was for medication renewal (20.7%), immunizations (11.0%), obtaining community resources (6.0%), and acute exacerbation of chronic hypertension (4.6%). Of note the Mississippi site did treat more acute injuries than the New Orleans clinic,
however this may be attributed to the fact that the Mississippi clinic was located in the parking lot of the hospital while the New Orleans clinic was located in an elementary school cafeteria. These authors concluded that victims of this study’s needs were from a lack of resources to deal with their chronic problems versus acute injuries imposed from the storm. Future planning may include the supplies and resources to administer and dispense medications for daily management of existing medical conditions (Millin, Jenkins and Krisch, 2006).

While much criticism has been aimed at governmental leaders for a lack of evacuation during Hurricane Katrina, a survey performed in July of 2005 found that 60% of respondents stated that they would leave if asked to do so by governmental leaders, however only 34% of those respondents stated that they definitely would leave. Since the inception of the DHS three large scale disaster simulations have been conducted and analyzed. Exercises included a storm in Louisiana and a chemical attack in New Jersey as well as a high yield explosion in Connecticut. While simulations had been completed, conclusions had not been finalized as some of the simulations involved twenty plus federal agencies, 30 plus state, 40 plus local and over 100 private-sector organizations (Wise, 2006).

A survey was conducted of Louisiana long term care facilities and hospitals regarding their emergency disaster plans and back up plans for safe water. While 75.9% of respondents were aware that their emergency disaster plan included alternate sources of water only 13.6% of long term care facilities and 65.2% of hospital respondents could identify those sources (Gerald, 2005). Additionally only 13.5% of the respondents stated that water at their facilities was tested.
Summary

OL has been widely written about with theoretical frameworks to guide the transmission of information. While empirical studies are limited, authors have demonstrated the successful implementation of the theoretical concepts (Daghfous, 2004; Fry and Griswold, 2003; Goh, 2003). EM is a process that requires teamwork throughout many interconnecting organizations for the preparation and management of disasters. These organizations are no different from the many other organizations that have benefited from the theoretical frameworks previously described (Argyris and Schon, 1978, 1986; Fiol and Lyles, 1985; Garvin, 2000; Kim, 1993; Levitt and March, 1988; Nevis et al., 1995; Schwandt and Marquardt, 2002; Senge, 1990) yet the research to demonstrate OL as a means of facilitating successful DM is even more limited. While Peterson and Perry (1999) demonstrate successful training exercises for DM, OL was not explored within their research.
CHAPTER 3
RESEARCH METHODS

Introduction

This chapter presents the research questions and definitions used within this study, then discusses why case study methodology was selected, followed by a description of the study design, a general review of the case study methodology, the data collection and analysis processes. Following these sections the interviews and the setting where the case study was conducted will be reviewed. The chapter will conclude with a discussion on trustworthiness and specifically discuss transferability, dependability, confirmability, and triangulation.

Research Questions

One county coroner’s office was selected for analysis within the interconnecting organizations involved in EM. The purpose of this study was to understand how learning occurs in the preparation of DM and crises in one particular bounded organization. A single county office was chosen to foster an in depth assessment of the organization. Yin (1994) stated that case study research methodology allows an in-depth analysis of a single unit or phenomena, within its real life context. The study will allow for an understanding of the members’ experience in relation to learning and disasters.

The following questions will be used to guide the study:

1. How does the Esson County Coroner’s office engage in organizational learning in preparation for disaster management (If it does)?

2. What type of learning does the organization engage?

3. How does the organization engage in (if it does) exploration versus exploitation in the learning of its members?
The intent of the questions was to facilitate a better understanding of how learning occurs and its role in the preparation of management during disasters and crises. A better understanding of learning may suggest ways in which an organization can improve preparation for disasters and crises management.

Definition of Terms

Organizational learning- the acquisition, interpretation, meaning making, banking into memory, and distribution of information.

Disaster- when resources of individuals and families become overwhelmed.

Single loop-learning- short term learning in order to rectify a problem

Double loop-learning-advanced learning that challenges the rules and norms of the organization, and questions the mission of the organization

Exploitation- searching for problem resolution within the organization

Exploration- searching for problem resolution outside of the organization

Design of the Study

A common view of research is that a theory is being tested within a specific context. Contrarily, a case study is conducted to see how the item relates to the theory, if at all. The framework helps determine the focus and precise purpose of the study. Following the suggestions of scholars (Mason, 2002; Merriam, 1998; Myers, 1997; O’Sullivan, Rassel & Berner, 2003; Stake, 1995; Yin, 2003) this particular study began with a general discussion with the coroner about the functioning of the office. At that time any available documents were obtained for analysis. The documents sought included brochures relevant to DM training, bulletin board announcements, meeting minutes, etc. The members were interviewed with tape-recorded conversations for analysis. As recommended by Merriam (1998) each conversation
was transcribed and analyzed prior to conducting a further interview, as clarification may be needed, or new ideas for research may develop. Once all interviews were completed, transcribed and analyzed, exploration for common themes was sought. Theme building was accomplished by coding of data within the transcripts which were then copied and pasted to a chart. The chart was then analyzed for patterns from the interviewees until themes were derived based upon the frequency of key words. Confirmation of the themes was analyzed with documents obtained throughout the research process, as well as observations made during meetings, or training sessions. Additionally notes taken during or immediately after the interviews, as well as during the analysis of transcripts were used for confirmation of identified themes.

The Qualitative Research Paradigm

As previously noted, qualitative research focuses upon interpretation of social and cultural phenomena (Mason, 2002; Merriam, 1998; Myers, 1997; O'Sullivan et al., 2003; Stake, 1995). Central to qualitative research is that the researcher is the primary instrument of data collection and analysis (Merriam, 1998; Stake, 1995). Frequently, the research is conducted in the field to obtain accurate observations of the setting, utilizing a systematic (McMillan, 2004; Stake, 1995; Yin, 2003) yet flexible (Merriam, 1998; O’Sullivan et al., 2003; Stake, 1995) methodology in the pursuit of the desired information. While objectivity is central to quantitative research, confirmability is central to the qualitative methodology.

Qualitative research is a systematic process of explaining phenomena within its context (McMillan, 2004). Explanations are sought to explain understanding and meaning within their natural settings based upon observation and narratives of the subjects. Unlike quantitative research which attempts to explain relationships numerically while controlling variables and operating under a rigid system, qualitative research utilizes a flexible methodology without
manipulating the subjects or data. Qualitative research is generally described by one of four methodologies: ethnography, grounded theory, phenomenology, or case study. Yin (2003) argued that CSR is “an empirical inquiry that investigates a contemporary phenomenon within its real-life context especially when the boundaries between phenomenon and context are not clearly evident” (p.13). Likewise, Merriam (1998) stated that CSR is the study of a phenomenon, which is inseparable from its context. While McMillan (2004) identifies quantitative research origins from a positivistic paradigm, qualitative research is also paradigm related. Three orientations were associated with qualitative learning: positivism, interpretivism, and critical science (Kim, 2003; Merriam, 1998; Myers, 1997). Merriam’s (1998) work appears somewhat confusing in that she argued that positivistic research is “measurable” (p.4), yet discussed this paradigm in qualitative case study as “contemporary phenomenon within its real-life context” (p.27); other authors (Kim, 2003; Myers, 1997; Yin, 2003) identified qualitative research from the positivistic paradigm. In the interpretive/constructivist paradigm (Kim 2003; Mason, 2002; McMillan, 2004; Merriam, 1998; Myers, 1997), reality is socially constructed and dependent on the context and complexity of the situation, whereas critical research (Kim, 2003; Merriam, 1998; Myers, 1997) explains culture and society and facilitates transformation. In critical research paradigms, a single true reality does not exist.

CSR is most closely aligned with the positivist paradigm (Myers, 1997). Myers argued, that positivists assume that reality is objectively driven and can be described by measurable properties which are independent of the observer and his or her instruments. Kim (2003) argued that positivism is based on the assumption that universal laws govern social events and uncovering these laws enables the researcher to describe, predict and control social phenomena. While not paradigm driven, Stake (1995) recognized the subjectiveness associated with the case-
study model, not to be confused as a short-coming, but to be accounted for both by the researcher and the reader. Subconscious intellectual shortcomings of the both the reader and researcher may negate the value of the interpretations of the study.

Case Study Methodology

Case study research is the exploration of a single unit or bounded system. The single unit can be as complex as an industrial corporation, or a single person within his or her specific context. Qualitatively the research seeks to gain an in-depth understanding of a situation and to the development of meaning-making of the individuals involved (Merriam, 1998; Myers, 1997; Stake, 1995; Yin, 2003).

Case studies are conducted when an in-depth knowledge is needed about a specific issue. The case has definite boundaries and parameters that foster a differentiation of inclusion versus exclusion of study interests and participants that are of relevance to the case. Case studies can be of a variety of forms, i.e. academic versus practical, single or multiple-cases. A case study can be broad and encompassing or very specific. For example a case study could involve a single department within an organization or focus upon a specific problem within the entire organization.

Merriam (1998) argued that a case study has the ability to “fence in” the area that is to be studied (p.27). Unlike quantitative research which attempts to make generalizations relevant to the rest of society based upon numerical conclusions, qualitative research attempts to tell society about a specific phenomenon within a particular place. Case study attempts to answer a specific question about a specific person, group, or institution.

Case study methodology was selected due to its ability to examine a bounded system (Stake, 1995), within its real-life context (Yin, 2003). While disaster management involves
numerous agencies of local, state and federal jurisdictions, this study was only interested in a single county coroner’s office. By utilizing case study methodology of a single entity, an in depth analysis was possible. The Esson County Coroner’s office was selected due to the researcher’s familiarity with the office and its function. Being a Chief Deputy within the Lebanon County Coroner’s Office the researcher was acquainted with some of the members through inter-county meetings as well as formal training seminars. Furthermore, being a deputy coroner fostered an access to the office that others likely would not have or understand. Having done the job for 12 years fostered an in-depth knowledge of the function of a coroner’s office. Furthermore my experience fostered an understanding of the terminology and working relationships with the various agencies that a coroner’s office interacts. I was able to explore the actors’ experience of disasters, training, and learning. This methodology also fostered the opportunity to explore the participants’ reflections since experiencing the disasters and training. By using qualitative techniques a better understanding was obtained of how, why, when, and with whom experiences such as exploration vs. exploitation had or had not occurred. More specifically, this study is focused upon determining how this particular organization learns to manage the potentiality of multiple, if not hundreds of casualties within a brief period of time (hours or days). The case study approach allowed an in depth examination of the learning within the organization. To be expanded upon later in this chapter, a deputy coroner has the same authority as the coroner in his or her absence. Therefore any deputy must be able to manage, on a moments notice, a disaster in the absence of the coroner. This study provided the opportunity to explore the learning mechanisms within the office as they relate to disaster management.
Data Collection and Data Analysis

Once adequate preparation had been concluded, collection of the data was the next process of the case study. Similar to the constant comparison (Yin, 2003) aspect of case study research, data collection can occur at any stage of the process. The earlier the sources of information are obtained, the likelihood of well developed questions is increased. Collecting the evidence involves six concepts identified by Yin (2003). The sources include documents, archival records, interviews, direct observation, participant-observation, and physical artifacts. Documents are “a wide range of written, visual, and physical material relevant to the study at hand” (Merriam, 1998). Documents desired include letters, memoranda, meeting minutes, meeting agendas, announcements, proposals, outside consultant reports of the case site, and media reports of the site (Yin, 2003). Within this study no meetings occurred so meeting observation was not undertaken. The announcement board, which is located within the reception area, was reviewed for communication relating to learning opportunities or other important announcements. Newspaper articles were reviewed when deaths were reported within Esson county. Additionally, the internet was searched for articles relating to the Esson County Coroner’s office. Specifically the articles were searched for activities by members and which members were identified as speakers for the office. The items obtained and analyzed were compared with findings from the transcribed individual interviews to substantiate and develop patterns. As with the interviews, caution was exercised in the analysis of written materials, as written documents are subject to inaccuracy due to error, author bias, etc. Similar to verbal communication, where body language can confirm or arouse suspicion of the spoken word, careful analysis of written documents may aid confirmation or stimulate curiosity for further investigation of developing themes.
Individual Interviews

Interviewing the participants is likely the most important aspect of the data collection process. Interviews are a necessary means of obtaining information at events for which researchers were absent and unable to observe behavior, feelings or participants interpretations of the events (Merriam, 1998). The questioning should be viewed as a guided discussion (Yin, 2003) versus an interrogation. Merriam (1998) describes the interview as a conversation with a purpose. One important purpose was to obtain information to develop a further line of questioning, both within the current interview as well as in subsequent discussions.

Following the disbursement of the recruitment script (Appendix A) and obtainment of informed consent (Appendix E) eight face to face interviews were conducted. Two of these discussions took place in the library of the interviewer’s place of employment, five took place at the Esson County Coroner’s office conference room, and one interview occurred at a restaurant. All of the interviews lasted approximately 45-60 minutes. The interviewer sought to remain focused, continue within the line of inquiry, ask the pre-determined questions (Appendix B), and yet foster a free flowing discussion. Questions were open-ended so that the interviewees could express themselves freely and openly, yet defined enough to obtain the necessary information without threatening or intimidating the interviewee. Questions that were avoided included multiple questions within a question, leading questions, and yes-or-no questions. Field notes were obtained to document gestures or body language that would not be documented via the tape recorder. While interviewing is a good source of corroboration, caution needs to be used when the various interviewees story is too similar. Too much similarity may indicate that the scenarios have been pre-arranged (Yin, 2003).
Following most of the interviews, further casual discussion continued. Field notes were written following the post interview discussions and transcribed into the reflective journal. Recorded interviews were transcribed, read multiple times, and analyzed for common themes and patterns as expressed by the participants, as well as searched for answers relating to learning, communication, disaster preparation, exploration, and exploitation. As recommended by Merriam (1998), analysis of the interviews began with the initial meeting, first interview, and post interview discussion. This fostered an ability to develop insights, hunches and tentative hypotheses that encouraged flexibility for the next phase of data collection. Each interview was transcribed and analyzed, then reanalyzed following each additional interview transcript. Triangulation was accomplished through a thorough review of the transcribed data, hand written notes taken during interviews, notes taken during casual conversations while present in the office, and observations of physical artifacts.

*Research Site: Overview and Description*

Coroners' offices are responsible for the determination of cause and manner of deaths within their respective county limits. While not all governmental agencies involved in EM can be discussed, a coroner's duties will be briefly discussed as this was the focus of the case study. The development of a disaster operational plan is essential to any such investigation.

The plan must delineate policies and procedures necessary for identification, documentation and processing of the victims and investigating the catastrophe. Such a plan must consider facilities, required services, specified personnel, administrative assistance, logistical resources, ancillary services, law enforcement and emergency response teams (Wagner & Froede, 1993, p.567.)
Large numbers of casualties require “a pre-disaster plan in which the involved authorities understand the nature of the task involved, the jurisdictions involved, the logistics necessary and the personnel required” (Wagner & Froede, 1993, p. 568). A death scene may result in multiple agencies with overlapping jurisdictions, including police, etc. which can function much more smoothly if pre-planning among the various agencies has taken place.

Coroners' offices are usually of two types. The office is identified as either a “coroner's” or as an office of “medical examiner.” The office is usually a county based office even though its identification may in fact state “city of.” The office holder of a medical examiner’s office is an official appointed by other elected officials (i.e. mayor, county executive, county commissioner), and must be a physician, usually a forensic pathologist. Coroners are officials elected by the general public and need not be medically trained.

Coroners’ offices are responsible for the determination of cause and manner of deaths within their respective county limits. While each individual state may have minor differences, not all deaths fall under a coroner’s jurisdiction. Deaths that are presumed suspicious, traumatic, unexpected, alcohol or substance related, and physician unattended deaths, require an investigation by the coroner’s office. Following the determination of jurisdiction, the coroner is permitted by law to perform an external and internal examination of the body. The coroner may perform or outsource the internal examination of the body. Coroners are also responsible for the proper identification and disposal of bodies in the event the decedent is unclaimed or unknown. Coroners frequently work in cooperation with local, state, and federal authorities due to the multiple agencies responsibilities of jurisdiction. For example a private plane crash will be investigated by the FAA while a commercial wreck will be handled by the NTSB. Children deaths need reported to the local social services while Sudden Unexplained Infant Deaths

64
(SUID) are reported to a national databank (Clark et al, 1996). While infrequent, a coroner’s office must be prepared for large numbers of casualties. In today’s changing world, natural and man-made disasters with potentially hundreds or thousands of deaths may occur within a single coroner’s jurisdiction. A disaster, simply put, has occurred when resources of individuals, families, or communities become overwhelmed (Waugh, 2000).

While a coroner’s office may have a unique function, the management and organizational structure is similar to any other organization. Learning is expected to be one of the key mechanisms through which organizations come to prevent and minimize the impact of disaster. (Carley & Harral, 1997). Currently, the Commonwealth of Pennsylvania requires successful completion of the Coroner’s Basic Education Course, offered through the Office of the Attorney General by the elected coroner and the chief deputy, in order to hold office. While DM training is a part of the educational process, the time spent is a mere fraction of the course. OL may be a useful tool to improve a coroner’s preparation of DM if a favorable correlation is observable.

The immense changes in the economic environment caused by globalization and technology have forced organizations from around the world to make significant transformations in order to adapt, survive, and to succeed in the new world in the new millennium. The demands put on organizations now require learning to be delivered faster, cheaper, and more effectively to a fluid workplace and mobile workforce more dramatically affected by daily changes in the marketplace than ever before. Organizational learning (OL) is a process that involves the acquisition, interpretation, meaning making, banking, and dissemination of information.

*Description of Esson County Coroner’s Office*

Coroners’ offices are responsible for the determination of cause and manner of
deaths within their respective county limits. Multiple opportunities exist for a mass disaster due to the daily activities of county residents and commuters. Esson County is located in the northeastern region of the United States and includes inner city, suburban and rural industrial, residential and recreational settings. The county houses the state capitol as well as an international airport, military base, nuclear instillation, academic medical center, resort and entertainment center. Additionally two interstate highways connect within the county with an additional state turnpike providing passageway through the county. Additional transportation includes a commercial railway system and a hub for passenger trains.

The Esson County coroner is elected during a general election by the county voters. The coroner, a non-medically trained individual, is serving his fifth term in addition to owning a private business. Due to being a non-medically trained coroner, the office contracts out necessary post-mortem medical examinations to a private practice forensic pathologist on a fee for service basis. The coroner is assisted by a full-time chief deputy, two full-time deputies, and four part-time deputy coroners. All of the appointed deputies serve at the pleasure of the elected coroner. The chief deputy is a full-time salaried county position and serves as the on-call person during the daytime hours. The other two full time deputies are salaried county positions and cover the evening and night time shifts respectively. The chief deputy also functions as the morgue deaner during post-mortem examinations assisting the pathologist. Thus far neither the coroner nor the chief deputy has experienced a disaster with a significant number of casualties, other than car crashes which contained 4-5 fatally injured persons.

The Esson County Coroner’s office is located in the suburbs of the county seat and unlike many county coroner offices, has its own building independent of any other county offices. Within the structure of the office are administrative offices for the coroner, chief deputy, the full-
time deputies, secretary, and changing and shower facilities for necroscopy workers. The offices were noted to contain book shelves with multiple text books on various subjects related to forensic science. Additionally, the office walls displayed diplomas and certificates of the members’ educational accomplishments. The coroner’s personal office wall displayed several photos taken with the governor and U.S. Senator as well as local politicians. Within the conference room are the diplomas and certificates of the coroner as well as the proclamation from the governor confirming the tabulation results of the general election confirming the victory of the current coroner. Also displayed within the coroner’s office conference room is a clay sculpture made by the coroner. Furniture within the conference room includes a long table with several chairs surrounding the wooden table, with one high back leather chair positioned at the center of the table. Clinical facilities include storage rooms for evidence, a walk in cooling storage, a conference room, viewing rooms for victim identification, and a post-mortem examination room with stainless steel tables for body examination and evidence collection.

The eight employees who were interviewed are members of the coroner’s office. The one member is elected during a general election for a four-year term. The other seven participants were appointed by the elected coroner. The seven members are all coroners who have the authority to legally declare an individual dead, certify the death on a certificate, and order an autopsy. Additionally, each deputy has the same authority as the elected coroner in his/her absence. All members were selected as two members (coroner and chief deputy) have administrative authority within the office. Analysis included comparison of perceptions of learning of the administrative versus non-administrative members of the office.
Members

Nick

Nick has been the coroner for seventeen years, first elected in 1990. Prior to being the elected coroner, he was a funeral director full time and prior to that was an investigator for the military while stationed in Europe. In addition to being coroner, he continues working as a funeral director. He currently holds a bachelors degree and is pursuing a master’s degree.

Mary

Mary is the chief deputy, and has been for the past 12 years. She initially became a deputy coroner for the county 25 years ago when the previous coroner held office and remained a deputy when the current coroner was elected. She holds a bachelors degree and also is a state certified paramedic.

Sam

Sam has been with the coroner’s office for 11 years first as a part-time deputy for 2 years and full-time for 9 years. Prior to becoming a deputy he had several years of experience in the fire and EMS, as well as five years of law enforcement within the military.

Ann

Ann has been a deputy coroner for six years. Prior to becoming a deputy, she had been involved in various aspects of EMS and continues with that on a part-time basis. Currently she is pursuing a bachelor’s degree.

Nancy

Nancy is a part-time deputy and has been involved in EMS for over 20 years. She initially was a volunteer prior to taking a paid EMS position. While working as an EMT she
became acquainted with members of the coroner’s office and recommended that she apply for the position.

Metro

Metro is a part-time deputy and has been for about one year. He has been involved in EMS type work for about 12 years. Additionally he grew up in a family that owned a funeral business.

Charles

Charles has been a deputy coroner for less than one year. Prior to his coroner work he has been involved in EMS and fire service for 14 years. Additionally he is a veteran of the U.S. military.

John

John has been a member of the coroner’s office for about 5 years. He has been involved in EMS and fire service for 15 years. Additionally he has been a full-time police officer for 6 years

Interviews

The primary method was tape-recorded in private face-to-face interviews in the locations previously identified within this chapter. Notes were kept for clarification, to elaborate on a specific point, to record participant observation/behavior, the physical setting, etc. Observations were made during time spent within the office, during interviews, and when observing the participants interactions. In order to explore OL opportunities, inquiry included open ended questions pertaining to the participants experience with disasters, experience in learning opportunities in preparation for DM, and actions taken when exposed to new challenges during a disaster. Additional exploration included who determines the members’ level of participation.
during learning activities, and organizational changes that have occurred since the Columbine school shooting and the terrorist attacks of 9/11.

Validation was facilitated through consultation with recognized experts within the fields of OL and DM in regards to inquiry content. Additionally, participants were provided the opportunity to review the transcripts and conclusions for comments, suggestions, and accuracy.

Trustworthiness

As with all research the value of the study is as good as its believed accuracy by its readers. Several techniques increase the likelihood of the study's credibility. The techniques to be discussed include transferability, dependability, confirmability, and triangulation.

Transferability

External validity establishes that the findings of the study are capable of generalization, to other situations, external to the case (Merriam, 1998; Yin, 2003). The researcher can enhance this test by accurately and adequately describing the research context and assumptions central to the research. This was accomplished by the thick rich descriptions of the participant's accounts from the transcripts as provided in chapter 4. By providing the "thick rich description," readers and subsequent researchers and determine the similarity of the situation described to their own scenarios. Searches were undertaken to examine for responses that did not fit, or in fact conflicted with patterns or trends that had developed. Searching for errors of participants' selection was unnecessary as all of the actors were members of the office. A disclaimer has been noted within the limitations section of this study regarding the generalizability of the findings. While the accurate description is the responsibility of the researcher, concluding the appropriateness of transferability of the case to an external situation is the duty of the reader who is attempting the transfer.
Dependability

Dependability is analogous to quantitative reliability. Reliability ensures that the results are reproducible. This means that, another researcher, who follows the identical protocol, arrives at similar conclusions (McMillan, 2004; Merriam, 1998; Yin, 2003). As it would not be possible to repeat the case, as the context and circumstances would not be identical, a researcher can enhance the dependability by accurate and thorough description of the procedures utilized during the study. The following methods were employed to ensure that dependability was obtained. A description of the study site was provided on page 65; the assumptions of the study were provided on page 74; the rationale for the selection of the participants was provided on page 66; the rationale for the selection of this methodology has been provided on page 59; the actual interview protocol is appended to this study; data collection was organized and currently maintained in a location retrievable by the researcher. The audio recorded interviews and transcripts will be maintained by the researcher consistent with the human subjects research protocol as outlined by The Pennsylvania State University. Yin (2003) has stated that documentation should be such that an auditor could repeat the procedures and arrive at the same results.

Confirmability

Confirmability refers to the extent to which the researcher’s findings can be corroborated or substantiated by others. Confirmability is analogous to quantitative objectivity (McMillan, 2004). Verification is enhanced by the researcher’s documentation of checking and rechecking results throughout the study. Additional enhancement is accomplished through the exploration of alternative explanations and their elimination as causative factors in the findings. Alternative explanations could be viewed as the devil’s advocate in exploring possible opposing
explanations. Guba & Lincoln (1989) have argued that confirmability is established when credibility, transferability and dependability are established. Throughout the study the researcher examined both process and conclusions drawn after each interview. Transcripts were examined to ensure that the same questions were being asked for each interview; furthermore, transcripts were reviewed to ensure participants were not led to responses to corroborate themes from previous interviews. For instance in attempting to explain some of the participants’ knowledge I attempted to eliminate informal learning as a means of knowledge obtainment for the members. As several members, in particular the part-time members, acknowledged that they had not attended formal training seminars; informal style of learning became increasingly apparent as the primary style of learning. I attempted to determine how the part-time members were able to explain in a similar manner, the functioning of the office when by all accounts limited staff meetings and inner-office training opportunities existed. With formal training eliminated as a possibility, informal learning became more apparent as a means of learning within the office.

Triangulation

While obtaining the data is an important process, caution must be used to obtain accurate information. Yin (1995) has described triangulation (verification) of data as the comparison of archival records, documents observations, interviews to arrive at the conclusions. Moreover this process is a comparison and cross-check of information obtained by different people at different times in comparison to observational and public data. For instance, several participants stated that Nick makes all of the public statements. This was then explored for verification by reviewing local newspapers and watching news clips to see who the spokesperson for the office actually was. In all newspaper accounts and televised news conferences the research findings were consistent with the participants’ responses. Additionally Yin (1995) has
recommended maintaining databases of the obtained information. Moreover an external observer should be able to “trace the steps from either direction (from conclusions back to initial research questions or from questions to conclusions)” (p. 105). Databases were organized so that the researcher and others who review the work can find the information without difficulty. It is recommended that databases have separate storage capacities for field notes be they transcripts, handwritten notes, observations, or handwritten stories by the participants. All documents retrieved or developed have been maintained in a locked cabinet. The items include notes obtained during initial meetings, observation notes during the interviews, post interview notes, notes of ideas that developed spontaneously during the research process, notes noting the database searches regarding the Esson County Coroner’s Office, as well as the transcription of the various notes. The notes and transcripts are also maintained on a computer at work with password protection, as well as on a home computer with password protection. Also an organized system of retrieved documents should be maintained for retrieval and review as needed. Yin (1995) has called for the maintenance of a chain of evidence. This chain allows an external observer to trace evidence either towards the conclusions or towards the source of the information. The records have been maintained allow an external reviewer to travel from the initial meeting with Nick, to the questions that were developed, to the first interview with the initial coding and recoding, through the development and advancement of the spreadsheets where themes developed, and post interview notes that substantiated the themes developed from the spread sheets. Maintaining this chain increases the reliability of the case.
Delimitations

- Participants were a predetermined group of individuals within a single county who have been appointed by the elected coroner.
- Face to face interviews were used for data collection. Participant confidentiality was maintained by using fictitious names when writing the results.
- The researcher may have limited observation time during an actual disaster due to the researcher's requirement of activation as disaster worker.

Limitations

- Generalizations of the results are limited due to the qualitative nature of the study and the number of participants.
- Participants may be reluctant to fully express their opinions due to a perceived lack of confidentiality.
- Participants have different categories of employment within the office such as full-time county employment versus casual part-time status, which may affect knowledge and enthusiasm of the organization and participation in learning activities.
- Participants may be inexperienced with disasters, thus limiting ability to relate to learning opportunities relevant to DM.

Assumptions

- Face to face interview is the best way to collect the data.
- Participants will be honest and forthcoming with their responses.
Summary

The focus of this chapter was to establish the research methodology and the parameters within which the study was conducted. The research was a qualitative case study in which individual interviews were conducted to obtain data regarding members’ learning in regards to disaster management. Interview transcripts were analyzed for common themes that developed. Triangulation was accomplished through analysis of documents such as educational materials, meeting minutes, and direct observations of learning activities.

It is anticipated that the results of this study will add to the literature base within the fields of adult education, organizational learning, and disaster management.
CHAPTER 4
RESEARCH FINDINGS

Introduction

Data obtained for this study were collected using face to face interviews of the members of the Esson County Coroners Office. Using a guide sheet of questions (Appendix B) the guided discussions were tape recorded and transcribed for analysis. Field notes and post interview notes were also transcribed and maintained to preserve the chain of evidence for this study.

Once the data were collected and analyzed, the study proceeded to the next phase and possibly the most difficult, the development of themes. Theme development consists of “making sense of the data” by consolidating, reducing and interpreting what people have said and what the researcher has seen (Merriam, 1998, p. 178). As suggested by Yin (1994), the final report was written in stages versus waiting until the final conclusions were drawn and then beginning the arduous task of writing the entire document. Categories were developed based upon the data developed and with the constant reminder of that the categories should be reflective of the “purpose of the research” (Merriam, 1998, p. 183).

The data gathered within this study, and analysis of the data, was governed by three main research questions identified on page 54:

1. How does the Esson County Coroner’s office engage in organizational learning in preparation for disaster management (If it does)?

2. What type of learning does the organization engage?

3. How does the organization engage in (if it does) exploration versus exploitation in the learning of its members?
While analyzing and interpreting the data, these research questions were posted where the researcher was working as a frequent reminder to the purpose of the study. As called for by Mason (2002), the researcher frequently revisited the following questions “what count as data or evidence in relation to my research questions? How do I wish to ‘read’ my data?” (p. 148). In developing themes categories were developed following guidelines outlined by Merriam (1998) in that the categories should a) reflect the purpose of the research; b) should be exhaustive; c) should be mutually exclusive; d) should be sensitizing; and e) should be conceptually congruent. The themes that emerged from this process are identified following a detailed description of the actual process that was followed.

Data analysis began following the initial interview with Sam. His interview transcripts were read several times. Initially the research focused upon three broad areas as they were the main focus of this study: learning, disaster management, and communication. After reading the transcript several times the researcher color coded responses that reflected the general subjects of the initial three broad codes. For example when analyzing the transcripts for learning the researcher followed the process as outlined by Granehem & Lundman (2004) where meaning units were obtained from the transcripts (Appendix C). Analysis of the meaning units resulted in the development of codes. From the codes, themes were developed that were representative of “the latent content of the text” (Granehem & Lundman, 2004, p.107). When some of the participants’ answers were deemed to overlap, they were double coded by either notations within the margins or a color coded note at the conclusion of the quote indicating possible overlap. For example when Nick discussed developing the disaster plan for the office he discussed disasters that other municipalities experienced and explored the type of disaster, their plans, how the agencies responded, and lessons learned.
Also following the analysis notes were taken that stimulated further questioning of other interviewees who were not initially on the general list of questions. For example it was noted that Sam was carrying a side arm. While I had not intended to inquire about members being armed while on duty, this was discussed with other deputies in subsequent interviews or post interviews. The same process was followed for the second, third, and fourth interviews, which were with the full-time deputies. There was no specific order in which the participants were chosen for the interviews, rather the interviews were conducted based upon the availability of the coroners. By the fourth interview, the researcher began to notice similarities in answers relating to learning. Obtainment of information occurred during organized educational activities as well as through informal discussions with co-workers. Additionally, similarities began to develop in that in-house resources as well as outside sources, were utilized for problem solving. Additional codes for learning resources from both within the organization and outside the organization were included.

Following the fourth interview I developed a graph (Appendix D) for each code. The graph included the direct quote within the first bar, the source and line number from the transcript within the second bar, and a blank space for notes or comments while analyzing the graphs where thoughts, hunches, intuitions could be inserted. Additionally, this space was used for insertion of comments or observations from the post interview notes. For example, when several members discussed Nick’s political skills, I noted from my initial visit to the office that Nick had reviewed his calendar with the office secretary and noted the number of meetings and political functions that he would be attending within the next few days. This information was included within the blank space for the code of specialization. Also within the blank space I was able to make notes as to whether the comment about learning referred to organized or informal
learning. By making this notation I was able to make a tally of the number of references to organized or casual learning setting.

After the 5th through 8th interviews, the same process was followed where quotations were analyzed by codes, then color coded, inserted in the coding graph and analyzed. Following the completion of all interviews, the graphs were analyzed for commonalities and themes were developed based upon the findings. The themes are listed on page 81.

While I was analyzed the transcripts and graphs, I used a constant comparison technique based upon the participants statements, my impressions and with observations that had been made. While I was not able to physically verify every statement that the participants made, observations were made that verified some of their statements. For example many of the participants stated that Nick was a good politician and spokesman for the office. A review of news reports when the county coroner’s office was making statements revealed that only Nick providing the information or his name listed when a written statement was made. I also noted during my first casual visit the number of political meetings and dinners that were on his docket for the following few days. Several of the members discussed organized coursework that had been taken. While I was not present for all of the courses, I had personally attended courses with some of the members in the past, most recently attended a course in the fall of 2006 with Sam and I noted the diplomas and certificates that the participants had displayed upon the walls. Additionally, I was able to view the course list on the bulletin board of available courses, past present, which corresponded with courses and locations that the participants discussed. I was unable to observe any office meetings as none occurred during the data collection period; however this corresponded with information from the participants that meetings occur infrequently and that the information occurs on an informal basis. For example when I asked
Sam how often the meetings occurred he responded “I would say on average, quarterly. Anywhere between 2-4 times per year he tries to.” Nick stated that one of the problems with meetings is that “the fact that you’re running 24/7 and it’s hard to get people from all the different shifts together at one time.” While interviewing Ann, I noted within my field notes that Nick interrupted our interview to discuss the results of a recently concluded meeting of an unresolved cold case from several years prior. This observation was noted to verify the participants’ statements that information transmission was frequently and informally distributed. Sam was noted, by several of the participants, to have special interest and expertise in the law enforcement end due to his prior military experience and part-time employment with a local police agency. As Metro gave me a tour of their late model vehicles (a sport utility vehicle and pick-up truck), he discussed how the emergency lights were of the latest style seen on police vehicles where the visual warning devices are barely noticeable until activated. This allows the vehicle to travel through the community without attracting undesired attention during non-emergent situations.

While themes normally develop after reviewing all of the data, two of the themes developed early within the data collection of the study. One consistent pattern which repeated was that learning occurred predominantly in an informal setting. This started to become apparent during the second to third interview. In fact, I was so conscious of this theme’s possible development that I made conscious efforts not to make the theme occur and to allow the theme to develop. I made extra efforts not to ask leading questions to elicit answers which might result in the further development of this theme. I even reviewed transcripts to analyze myself and my questioning techniques to ensure that I was not leading the interviewees into answers that I had begun to anticipate. For example in one of the latter interviews when a participant was discussing his role within the office, I asked “How have you learned what to do as a Coroner”?

80
Consistently, the participants discussed learning as occurring informally and that communication amongst the members occurred informally.

Themes Emerging from the Study

1. Learning occurs in both organized and informal settings
2. Communication occurs mostly informally
3. Members are encouraged to develop area of expertise

Theme: Learning occurs in both organized and informal settings

After viewing the data a total of 56 responses referred to the formal training that had been undertaken when asked how they learned what they currently know. Nick stated that “every year, every full time deputy goes to school.” Sam specifically stated “Training, Formal training.” Nick responded that his initial knowledge developed when “I went out to St. Louis School of Medicine where they have a basic and a Master’s course and I have taken courses ever since specializing in blood pattern analysis, crime scene management, shallow grave recovery and forensic sculpting.” When asked whether the blood pattern analysis was within the same course he responded, “No, I did mine at Northwestern University.” Specifically as learning pertains to disaster management he stated, “I just completed some training on the incident command system” as well as “the FAA requires Metro International to have disaster training and we’ve participated in that and that has been very, very helpful.” Sam also mentioned the mandatory training at the local international airport and stated, “I’ve been through a couple of those so far since I’ve been here down at the North end of the runway.” Mary added, “we go to the table top drills that they have at the airport and stuff and we participated as an office on I don’t know how many actual drills at the airport.” While Ann has never participated she noted, “We’ve participated with their drills...I haven’t...I’ve never been available.” Other formal training
identified by Sam was “Weapons of mass destruction classes, I never knew what that was before 9/11 and now I’ve been to a couple of them.” Mary added that, “I’ve been taking some classes down at the NTSB academy.” Nancy identified formal learning experiences with “I have taken some county run classes” as well as “I’ve gone up to Allegheny County twice and taken their day seminars which were very interesting.” Nick also stated, “I was just down there for anthropology. That was actually from the Armed Forces Pathology Institute.”

Informal learning was also identified based upon the discussions with the coroners. All mentioned that information is free flowing within their office and that most information is passed informally. Perhaps the greatest indicator of the casual information distribution was the fact the Sam has noted a difference since being on the night shift. He stated, “We just had a staff meeting a couple weeks ago and there was lot of stuff that my eyes were opened to that I didn’t know we had going on.” He expanded upon the difference by stating “with me, with the staff meeting it seemed like a lot of people knew what was going on with things, but with me being on nights and being by myself, the communication is kind of ‘eh’”. Ann described the learning interactions as “Very easy. Very free-flowing. I have no compunction about pulling any of them and saying ‘hey I need a little help here’ or ‘what do you think about this’ or ‘this is what I recommend’ and then see which way they want to go.” When asked how she knew how to call for a DMORT team in a disaster she replied, “Both training and casual conversation. Mary and I have had them.” When Nick was asked about the communication among the office members regarding knowledge of specialization he replied “Very well! Yes.” He further clarified that the information was transmitted “Not formal, informal.” Nick further added, “We learn from each other.” Nancy also described her knowledge of other members’ abilities and skills with “Just in communicating.” When asked whether that was informally she replied “Oh yeah.” Mary
discussed information that individual members obtain from formal training and stated, "Yes, it gets shared." Charles stated that learning occurs from one another, "So passing on experiences from call to call, that's what we do." Metro stated that he learned mostly by doing, "A lot of reading, a lot of reading over old cases, other people's cases." John stated, "We've had like 1-2 staff meetings where things were covered, but nothing formal. Usually sometimes in a really neat case, informally we'll talk about how you handled it and such."

While organized training sessions were discussed, in particular disaster management, the participants were unable to demonstrate applying their knowledge in disaster situations due to a lack of disasters. However they were able to discuss applying their knowledge from formal class training in other aspects of the job. Charles discussed a shooting scene that he was called to. He stated, "Now, we had a case which involved ballistics and shooting that we were able to take some of the stuff we learned from a class, in fact I was lucky when me and Nick went we were able to trace out how high the gun was as if fired and trace it out using the rods, find trajectories and all that stuff, and I was able to pass that along and say, 'hey we were actually able to use what we learned in the class we just took and it all worked out and actually worked.’” Ann has been identified as having trained in shallow grave recovery. Several members discussed her expertise and iterated her being called to a scene specifically for her unique knowledge. Nancy stated about her knowledge of this area that "she was present during it and based on what she had learned is how they exhumed that body to preserve the evidence.” Sam, who was on duty and called for her assistance, stated, "first person I called was Ann. She had said that 'you've been doing this longer than I have' but I said 'yes, but I've never had any type of shallow grave recovery training and you just had it a month ago.'"
Both Sam and Mary discussed attending formal training sessions regarding disaster management. Through their training, both realized errors that were made during training sessions at the local international airport. Both commented upon the contamination of the scene when firefighters were moving mannequin body parts from their original position prior to the scene being fully processed to include photographs, tagging, and proper documentation in the scene grid. Sam stated that he immediately went to the chief and said, "Chief, what the hell is he doing?!? He can't do that!"

Theme: Communication occurs mostly informally

Another theme that was voiced by the participants was that communication was frequent, encouraged, and informal. Sam acknowledged that his communication is less than others due to working the night shift however he overcomes that barrier by email. He stated that "when anything important comes up, probably on average 4-5 times per week I get e-mails from my secretary at home just to let me know." He also stated that "if Nick or Mary needs something they call and talk to me about it but just the normal day-to-day stuff I have found I've been out of the loop since I'm on night shift." Mary stated that "So we interact other than just on calls.”

When Ann was asked whether a lot of communication existed within their office she responded “I think so.” Metro stated, “If we ever have any questions on something we just call each other or if we need help or something.” When discussing communication within the office and other agencies, Nick stated that “Yeah, I'm trying to have good interaction with the medical community, good interaction, with most of our people getting sworn in for the Capital Area Forensic Unit.” Nancy stated, “anytime you think that you're in over your head you can call and somebody will come bail you out.” Charles stated, regarding communication, “Oh good. We keep each other abreast of what's going on, changes, upcoming classes, different e-mails.” When
asked about the frequency of communication he replied “Daily.” When discussing the ease of talking with fellow deputies he replied, “Oh definitely.” Metro stated, “We pretty much run across each other, everybody is in EMS.” Metro stated “I think we have a great relationship with all the local organizations.”

Theme: Members are encouraged to develop area of expertise

Nearly all members expressed that encouragement and support exist for the development of areas of expertise. Sam stated, “everyone has started to specialize in certain things, so we have our own, not experts, but our own resources within our offices.” Sam also quoted Nick as saying, “Nick just said that with staffing with different people with different specialties, call me for fire related deaths. Mary has had the forensic entomology classes. Any unusual bugs, call Mary.” Mary discussed similar comments stating, “We’re all kind of like doing our own little special thing, like Ann is into the anthropology and shallow graves and that kind of stuff, Sam is more into like fire investigation and accidents and I’m into I guess now plane crashes.” Mary expanded upon the expertise stating, “Ann has been up to Mercyhurst twice, up to their forensic anthropology class that they sponsor and Mac has been involved with going to training for fire and accidents.” Metro iterated a similar understanding regarding Ann, “I believe Ann is kind of a bug girl, anything with bones, she's a little more up on it.” Nick stated that, “what I'm trying to do is get the Deputies to find an area of interest so I don't duplicate interests. I'd prefer to have someone that's interested in elder abuse, one that's interested in child abuse, fire, MVAs, blood pattern analysis; I don't want to duplicate the training.” Ann stated, “I'm on the child death review board for the county so there's stuff I do for that.” When asked about whether she performs certain tasks she replied, “No, Sam is supposed to be doing that.” She also stated that Nick is “really good to go to as well if I want an authoritative answer.” Nancy stated, “you can
kind of poke around and find where you're comfortable and excel and contribute in this fashion.”

She also stated that “You set your own little goals and this is what I want to learn more on and become a little more proficient in.” Charles replied that “Each one of us has a certain thing that we are supposed to technically do, and with my time I really haven't been assigned but I really would like to start working on some of the cold cases that we have.” Metro stated, “Right now we're trying to ...we'd like to have each of us kind of specialized in something.”

During my discussions with Nick, I noted that he iterated similar sentiments regarding development of individual expertise. Nick stated that he had encouraged the various members to develop an area of expertise. Several of the deputies stated that Nick encourages them to develop areas of interest/expertise. While no one ever stated that the encouragement was formal or informal I concluded that the incentive was casual and informal. This conclusion was supported by comments by Mary when she stated “We're all kind of like doing our own little special thing” and Nancy stating “Anybody can pick something that they're interested in,” Graham stating “what I'm trying to do is get the Deputies to find an area of interest so I don't duplicate interests,” and Charles stating “I really haven't been assigned.” I was able to triangulate statements from the participants with observations while conducting the interviews. While several members expressed that Charles had developed an interest in law enforcement and fire related deaths, I interpreted this with his previous discussions regarding his previous fire service, experience as law enforcement officer within the military. I also noted during the post interview discussion that Charles was carrying a firearm on his belt. This led to further discussion regarding the various members carrying firearms and that the members qualify at a shooting range with the sheriff’s department and are authorized to possess a concealed weapon. While all members did not carry at all times, I did note that Metro was carrying his firearm while
on-duty for a weekend shift. I also noted that Charles was ending his night shift. I observed that the other deputies on day shift were not armed and that members usually are more likely to be armed on the non-day shifts. During the after interview discussion with Metro I was given a tour of the departments up to date vehicles where Metro discussed Charles being responsible for the state of the art emergency warning lights and vehicle design due to his experience with law enforcement. I also was able to verify Mary's specialization by her comments “I'm into I guess now plane crashes,” Graham stating that Mary “just came back from an NTSB school for mass disaster,” any my observations of certificates of course completion mounted on her office wall.

Summary

The major themes that developed were identified within this chapter. The themes developed include: learning occurs in both organized and informal settings, communication occurs mostly informally and that members are encouraged to develop areas of expertise. While these are the main findings within this study, other conclusions were made based upon analysis of the data.
CHAPTER 5

CONCLUSIONS

Introduction

Following the determination and identification of themes the next and final phase of a case study is the conclusions drawn, and the recommendations gleaned from the data. The conclusions will be drawn based upon the overarching questions that were identified on pages 55 and 75 preceded by other general conclusions.

Outcomes

Based upon the definitions established in Chapter 2, The Essex County Coroner’s office meets the criteria defined by Argyris (1999) of an organization, in that the participants can describe themselves as “we.” Several members of the office discussed that they were a tight knit unit and further stated that in order to become a member of the office you had to know a member. Furthermore, Argyris (1999) states that members of an organization are able to state who is and who is not a member of the organization. Several of the participants described scenarios where their authority was challenged by an outsider, and with the backing, of the administrative coroners, the deputies were able to re-assert the authority of the office. Garvin (2000) stated that an organization has learned when it changes its activities in response to new knowledge or insight. Several of the participants discussed that each member has an area of specialization and that the various members are aware of each other’s expertise. In particular, the participants described how a crime scene was secured until a member with specific knowledge was able to arrive and assist with the processing of the scene.

Single loop learning prevailed over double loop learning based upon the responses of the participants. Most of the responses that involved learning as a result of problem solving.
tended to be related to answering a question about a specific item or problem within a case. While the information could, and likely would, be applied to future cases, the information sought was aimed at answering a specific problem. This is not to say that double-loop style learning was not observed. Double loop learning entails the restructuring of norms with associated strategies and assumptions that seek to resolve the incompatible organizational norms (Argyris and Schon, 1978). For example, Nick was aware that a conflict existed in the information that some of the members had after attendance of training seminars and the needs of all of the members of the office in order for effectiveness. He expressed an understanding for the need of the information for all of the members, yet the diffusion of information was not occurring. Garvin (1993) argued that an LO learns from the experiences and past practices from others. Nick was aware that members of the office possessed information following attendance at training seminars and that the information was not being transmitted effectively throughout the organization. He developed the idea of Power Point presentations, developed by the various members of their newly acquired knowledge, so that the information could be shared with all of the members, based upon their availability to review the information. While single loop learning may have been observed more frequently, this was not viewed as a negative. In fact most of the participants’ responses were supportive of the leadership of the office and the manner in which the organization was run. Many of the participants stated that they felt that their organization was better organized, better supplied, and better functioning than other county coroner offices. In fact some expressed surprise at learning that some counties do not even have an office, let alone the examination and storage facilities that their office contains. While members have expressed their support of the functioning of the office, a fact that should be noted the length of
service of the full-time deputies. For example Mary has been with the office for greater than 20 years, Charles has been present for 12 years, and Ann has been a deputy for six years.

DLL is more complex, and less binary than challenging of norms of organizations. The behavior that I observed was more advanced than the simple detection and correction of error as described by Argyris and Schon (1978). The problems solved involved more than the light switch example that Argyris discusses, where once the light is illuminated the problem is solved. The answer being sought at times involves a journey through inclusion and exclusion of complex information in an attempt to explain a cause of death. The resources of information include, their formal training, their colleagues, formal training, the libraries that each member has assembled and the relationships that have been established outside of the organization. Several of the participants had identified the various libraries that each member was developing and the availability of the library documents for all members’ usage. Furthermore, the learned knowledge is transferred across the organization in order for the other members to reap the benefits of the newly acquired knowledge. The information transfusion across the organization was apparent by the similar responses described by colleagues who were not physically present for all activities. While DLL may have occurred at the administrative levels on a more regular basis as described by Fiol and Lyles (1985) evidence of this was noted in the behaviors of the other members as demonstrated by their knowledge of knowing who to call Ann for a shallow grave exhumation. The actors demonstrated DLL as called for by Argyris (1976) by summoning relevant members to maximize the contributions of other members to achieve a desired state. Dixon (1999) called for members' authority to take responsible action based upon interpreted meaning in their own context. Based upon responses from Nick and the other members, I was able to conclude that the actors felt safe to summon other members of the group whose were
deemed to have knowledge that was needed to resolve an undesirable state. The members had an understanding through the norms of their organization that they had the support of the leadership to call upon each other, versus senior management, without fear of repercussion from the administrators as called for by Garvin (2000). Goh (1998) argued that a learning organization is one where employees are empowered to act based upon the relevant knowledge and skills they have acquired, and the priorities of the organization. Furthermore, the members actions, of calling upon one another, are representative of a higher level of learning, as described by Fiol and Lyles (1985) and demonstrates one of the characteristics central to Handy’s (1995) learning wheel-togetherness.

The finding that SLL prevails over DLL learning is supported by the theoretical model (Argyris and Schon, 1978) as well as within empirical studies. Argyris and Schon’s model states that most organizations utilize SLL well however experience difficulties and resistance to DLL. While DLL was not observed within this study it does not necessarily reflect on the organization as inflexible or resistant, but that a situation may never have arisen to cause the disequilibrium that fosters the need for DLL. These findings correlate with findings from empirical studies in that SLL occurs more frequently than DLL. Tucker et al. (2002) found that nurses engaged in SLL type learning more commonly than DLL and was attributed to the fact that the workload of the nurses was not conducive to DL style learning. Within my study similar reasons exist that may result in SL type learning. One factor is the work load and another is the fact that the office is a 24/7 type operation and attempting to assimilate the various members is difficult. As Nick stated, “One of the problems with the training thus far has been the fact that you're running 24/7 and it's hard to get people from all the different shifts to one time.” It should be noted, however, that in the Tucker et al. (2002) study the fact that a significantly higher number of actors may
have precluded DLL learning whereas in the Esson County Coroner’s Office the number is significantly lower.

The Esson County Coroner’s Office demonstrated Goh’s (1998) strategic building blocks that foster organizational learning. The blocks include mission and vision, leadership, experimentation, transfer of knowledge, and teamwork and cooperation. The members all stated a support of the organization and its members. Sam stated, “my office never looks bad I don't ever do anything that makes myself or him (Nick) look bad.” The office’s leadership empowers members through encouraging individual interest and specialization. Money is available and provided for the members to attend formal learning opportunities within their chosen specialization. Nick stated “Every year, every full time deputy goes to school.” Transfer of knowledge, both from within and outside the organization was evident based upon the responses of the participants. John stated, “There's some of the guys, the detectives from the police departments, I have them in my cell phone and I know I can call them anytime day or night, and most of them, at least I know the rapport I have with them being a police officer and working here with them, I know most of them would get out of bed in the middle of the night if I had a problem or answer a question or anything like that.” Team work and cooperation has been identified by all of the members of the organization Charles stated, “We keep each other abreast of what's going on, changes, upcoming classes, different e-mails.”

Several types of learning have been noted through the discussion with the participants. Single-loop and double-loop learning has already been discussed. Another form of learning based upon the discussion with the participants was informal as well as formal learning. Nearly all members expressed comments that learning was encouraged both formally and informally. The formal training occurs at agencies both locally and at distant sites and is paid for through
county funding. In fact several of the full-time members have traveled to the national course offered at St. Louis University which covers nearly all aspects of forensic investigation while other formal training has been recent and specific to potential disasters such as the Avian flu. The formal training included not just factual information, such as what to do and not what to do, but also covers the functioning of the office, its capabilities, what the other members strengths are, who to contact for certain scenarios, etc. The participants expressed a favorable opinion regarding having members provide presentations upon return from formal training sessions, however the practicality of that occurring was recognized as full-time members do shift work, and part-time members are busy with their full-time jobs outside of the coroner’s office. One possibility being considered to facilitate the knowledge obtained by members who attend formal training sessions is to develop Power Point presentations and have the presentations on the computer where members could view the material at their convenience. However this alternative learning style has not been implemented within the office thus far.

The participants expressed that learning is frequent and informal amongst the various members. While one expressed that his communication is limited due to being on the night shift and having limited contact, no other coroners expressed such limitations. In particular, some of the newer members and part-time members expressed how willing the full-time members were to field questions or were willing to come to a scene if needed, even if they were not on call or on duty. The learning does not take place just within the office setting or while on duty: Nearly all of the participants acknowledge their similar outside activities such as law enforcement and EMS, which result in frequent contact and overlap of duties and responsibilities. This overlap results in increased communication as well as camaraderie of the participants. Learning was viewed to take place during the outside social contacts as well as discussions within the office.
setting. Gerber (1998) identifies self-education both on and off the job and interaction with others as manners which exemplify a learning organization. Furthermore, Gerber states that formal training fosters group learning and interaction among co-workers.

Much of the training is self-directed, as described by Gerber (1998), as participants are free to pursue areas of interest. Ann stated that during down time, “I’ll sit and do school work or read some of my literature as regards to forensics.” Several of the participants mentioned that the coroner serves as a role model towards learning as they discussed his vast knowledge in multiple areas. Furthermore they expressed that he is well read in multiple areas yet open to use their resources to enhance his learning. All of the participants mentioned that they are encouraged to develop areas of interest and specialization for the betterment of the office and the coroner stated specifically that he wanted members to develop areas of specialization and serve as a go to person. Particularly, the coroner did not want to have members duplicate specialization. The participants expressed both personal and office enhancements by having members specialize in areas of interest.

On the job training was also mentioned by several of the members when asked how they learned to do their job. A few stated that they learned by flying by the seat of their pants. Many felt that their previous training was an enhancement for building upon their coroner training. All deputy coroners, be they full-time or part-time employees, have been or are currently EMTs and a few are former or current law enforcement officials. All stated that their previous training provided a good base knowledge for what is needed within the coroner’s office. Particularly the participants felt that their previous training aided them to manage a disaster scene as their training has prepared them to be flexible, handle the unexpected, and rely on intuition.
Several participants stated that they really cannot be prepared for a disaster, and that many decisions will have to be made at the time. Some of these sentiments derived from other agencies that had disaster plans yet did not use them when disasters occurred as was noted by Carley and Harrald (1997). September 11th was mentioned particularly the scene in Shanksville Pennsylvania, where the coroner’s office was a predominantly rural region with few cases, yet suddenly experienced an international scene with multiple federal agencies, but was viewed to have successfully managed the disaster scene. An Avian flu outbreak was also mentioned, which would be nearly impossible to prepare for as many health care providers would likely be ill and many decisions would have to be made at the time. Another example cited as learning during the event was the airplane crash in the Florida Everglades. While there was significant concern initially about alligators endangering the emergency personnel, the on-scene personnel soon learned that the alligators were not a threat due to the fuel in the water being an irritant to the reptiles’ eyes. The alligators fled the scene and not a single animal was shot.

The study’s participants frequently discussed the usage of outside sources (exploration) to gain knowledge or to seek a solution to a problem. Some members discussed taking formal courses from outside agencies to advance their knowledge within a specific field; others discussed individuals by name that they feel free to call upon when a question arises. The members discussed their outside experiences and relationships frequently when discussing their sources to call upon when help is needed. Most expressed the importance of maintaining their relationships to foster these problem solving abilities. Agencies identified were EMS, fire departments, the municipal police agencies, combined county task forces, and state crime scene units. The private practice forensic pathologist that the office consults was frequently listed as a resource to seek when a medical question’s solution was being sought.
Nick states that when analyzing other agencies' disaster plans, voluminous information was contained within the plans, as was found in an empirical study (Carley and Herrald, 1999), yet, the plans were widely unread. In particular when re-writing the disaster plan for the Esson County Coroner's office, contacts with other municipalities who experienced disasters were identified, as well as the lessons learned from those experiences. The participants also discussed teaming up with a state game commission when a deer was buried and later exhumed in learning the proper manner of exhumation as well as the decomposition changes that assist in the determination of approximate time of death and time of burial. Since 9/11, federal agencies such as the FBI have been used as a resource, although the contact with the federal agency occurs less frequently than with local and state agencies. Attendance at training sessions have fostered relationships with disaster personnel who were present at various major disasters within the U.S. including ground zero, Shanksville, Pennsylvania, the Pentagon, and the airplane crash in the Florida Everglades.

While the members spoke favorably regarding their outside sources for problem resolution, the participants mentioned inside sources as their initial source of guidance. Nearly all deputies mentioned that the coroner was a great resource to turn to in nearly all categories. Additionally, members were aware of each others areas of specialization and stated how quickly they will call a fellow deputy who has a specific knowledge within a particular area. Several mentioned the various areas of specialization that the other members have. All mentioned the willingness of the various members whenever a question arises. In particular several members discussed how the one member was called to a scene even though not on duty when her expertise was needed at a shallow grave exhumation scene. Within the office the various members have developed individual libraries within their areas of interest and specialization. Members are
encouraged make use of the various libraries developed and to continue to develop and advance their interests and libraries.

Perhaps the most important aspect of the facilitation of the exploitation within the office is the casualness of communication by the members. All of the members of the office identified communication as a good aspect of the job that the communication was free flowing and everybody was approachable. Unanimously, the participants stated that they could call upon any of the members at any time to ask a question or to ask for help. As all of the participants are involved in EMS outside the office communication occurs both within the workplace as well as in common outside activities.

Members of the coroner’s office expressed both exploration and exploitation in seeking answers to problems and information. Empirical studies (Van Deusen & Mueller, 1999; Holmqvist, 2004) have demonstrated beneficial outcomes when both exploration and exploitation were used versus exploration or exploitation alone.

Each member plays an active role in their own learning for the office. While activities are encouraged and provided no formal mandatory guidelines are provided for the part-time deputies who have no state mandates. Furthermore, the office does not have a separate set of guidelines for the full-time deputies other than what the state requires. However members are free and encouraged to play an active role in learning activities. Participation is encouraged through joint county task forces where several departmental agencies have a complimentary role in managing death scenes. The coroner has buried pigs on a farm site that will be exhumed at a later date for training purposes and all members are welcome to attend and participate. The learning goals include the proper techniques of exhuming the body to, and attempts in the
determination of the approximate time of burial, based upon decomposition changes and insect morphology.

While members play an active role in their learning processes they also play an active role from a teaching standpoint. Several of the members actively teach at local schools who offer forensic medicine training as a vocation. Other members serve as adjunct faculty members at a local college for relevant courses. Additionally, the office serves as a preceptor for students doing internships in forensic medicine and the various members function as mentors for the learners.

The coroner's office does not have a formal list of learning objectives that the members are expected to demonstrate. The office does have a standard operating procedures manual that is provided to all of the members which is a guide to managing the various death scenes that will be encountered. The SOP was mentioned by nearly all of the deputies as a learning tool and all have stated that they have read and continually use the book.

For the elected coroner, chief deputy, and the full-time deputies, the objectives are straightforward through completion of the mandatory state-run course in order to hold office or serve full-time. Additionally each of these individuals is required to maintain eight hours of state approved training annually. However the manner of maintaining the eight hours is very flexible. A wide variety of course offerings are provided throughout the year that may vary from crash reconstruction to blood spattering interpretation to insect recognition from the decomposition process.

While the evaluation process is not formal from a learning standpoint, each case is reviewed by the coroner or chief deputy, as they are the only two authorized to sign the death certificates. The members' learning is evaluated by manner of investigation and quality of field
report drafted by the deputies. While each deputy has a slightly different manner of investigation and level of expertise all are expected to follow the SOP manual. Several of the deputies have stated that if the manual is followed they can not go wrong.

With the exception of Nick, none of the participants were familiar with the content of the disaster plan; in fact some did not know that one existed. One was aware that an antiquated plan existed and was being revised, however was not involved with the drafting of the new document. While the participants did not know the location or the content of the current or revised plan in progress, considerable knowledge of disaster planning was evident. Several had participated in disaster drills that occur periodically within local entities which have a likelihood of significant numbers of casualties in the event of an accidental or deliberate event. In particular, the full-time deputies demonstrated a greater degree of knowledge regarding disaster preparation than the part-time employees; however, the part-time deputies did exhibit knowledge of disaster preparation. When outlining a disaster plan by their own design, several of the participants, particularly the full-time, used terminology from the federal governments all purpose disaster plan. Several members had expressed participating within the drills, while others were aware of the drills and expressed sentiments similar to those who were present, further supporting the level of communication within the office. The full-time members demonstrated a more consistent awareness of what the office’s capabilities were from a volume standpoint as well as what was considered a disaster for the office. During the writing of the final chapters, the Esson county coroner’s office did have a traffic accident in which three persons were killed. The management of the scene was conducted using usual office procedures without summoning assistance from any outside agencies. However the part-time coroners were aware of location of disaster equipment as well as types of supplies (e.g. number of body bags in storage). The part-
time members were as aware of supplies needed from outside sources such as refrigeration trucks for storage of bodies during the examination and identification process. All were aware that assistance was available upon request from state and federal agencies.

One area of concern is that the members, were all unfamiliar with their own office's disaster plan. While Mary knew where it was, she acknowledged that it was outdated and in the process of revision however, she had not reviewed the revisions. While the participants did not specifically know their own plan, their responses to disasters did indicate that they were familiar with what to do, the resources that were available within their own office, and how to contact needed outside sources.

While it may seem alarming that the participants did not know their own plan this has been reported within the literature previously. Carley and Harrald (1997) found that responders were unfamiliar with the disaster plan when the Miami Hurricane of 1992 struck. This was in part to having no involvement with the plan. Kartez and Lindell (1990) found that members fail to plan due to a lack of experience with disasters. A lack of experience with disasters was noted by the participants within this study. While two members, Nick and Ann, had participated in disasters at the World Trace Center site and Hurricane Katrina respectively, their participation was in capacities other than as coroners. None of the other members cited any experience with disasters. What may be beneficial based upon previous findings of Carley and Harrald (1997), based upon findings within the empirical literature and contrasted with the findings within this study, I recommend that the members of the office be directly involved with the development of the office disaster plan. While it difficult to foster an environment that provides experience in disaster management which Kartez and Lindell (1990) found beneficial, a sense of ownership of
the plan, as recommended by Carley and Harrald (1997), may foster an increased awareness of
the plan in the event a disaster occurs.

Single-loop learning

Single-loop type learning was more commonly demonstrated than double-loop style
learning. When asked what other staff did when they didn't know what to do Sam replied, "we
do have an S.O.P. book that says what we're supposed to do and just what is expected of me and
we do everything by the letter." He further added, "Whatever case you get is outlined in here.
Whatever it is, as long as they follow it to the letter, they can never go wrong." Nancy added a
similar statement stating "there is a booklet full of information." John stated, "Read the
handbook that we're issued is basically idiot-proof. Even with someone without any background
as long as you follow the steps, you can pretty much handle anything." Charles stated, "If we
have a question about anything, we call Nick or Mary." Metro stated, "Call Nick. Call Mary."

While single-loop learning prevailed, double-loop learning statements were made
regarding future changes to learning enhancement. When asked whether deputies provide in-
services to the others within the office following specific training, Nick replied, "This is actually
something that was suggested that we're going to do in the future." When discussing dispersion
of information across the organization, Nick stated, "I think we can probably take care of that in
the future by setting up training monitors on PowerPoint so they can just come in and sit down
on the computer."

Both exploration and exploitation are present

Exploration was found during my analysis of the transcripts by several of the members.
Sam stated "they have what is called the Capital Area Forensic Unit; it used to be the 'We Team'
and now it's the Capital Area Forensic Unit between McMurray and Esson counties." He also
identified another agency from which learning had been shared. “The State Game commission
buried a deer and we had that, and then they also set up 3-4 different mock crime scenes.” Ann
identified a forensic pathologist several times during her discussions whom she consults with
when facing a question. “Our forensic pathologist, Bill,” “Dr. Jones he’s a wonderful source,
love him,” “I’ll call Bill a lot if I have to talk to the family.” “He’s just good to run cases.” Nick
also iterated “the forensic pathologist Dr. Jones, the forensic pathologist” among a few other
pathologists as sources of information he currently uses or has used in the past. He also stated
“Harry File, of course, he was one of the guys that mentored me and he is an icon in pathology.
He was really a great help to me when I first started up. And Dr. Michaels, he was also very
good from a pathology point.” Nick also identified “Other coroners, if they have handled a
specific type of case,” as well as “different CSI people that I work with.” In preparation for
disaster planning Nick identified sources outside the office as learning tools. “I think we looked
at Los Angeles, Oklahoma, wherever disasters were.” Nancy identified other agencies as helpful
when in need “But we’re also lucky because the police department and the fire departments and
EMS help us out.”

While exploration was identified within the responses of the participants’, exploitation
was also recognized throughout the discussions. Mary and Nick were identified as frequent
sources of information to call upon. However these two also had administrative responsibilities
for the office which may have affected the number of times they were cited as sources of
information. Sam stated “on any type of death that they might be called to investigate, to call
Nick, if Nick is unavailable, call Mary.” Sam also stated, “So, between Mary and Ann having it,
they are my resource in my office on how to do this.” Ann also made similar comments when
asked on whom she calls initially: “Mary. Chief Deputy. Nick.” Nancy also made similar
comments, “my first call would be Mary.” Charles replied, “We’re to call Nick or Mary.”

Metro stated, “Call Nick. Call Mary; call one of the other deputies who have been here for a while. Everybody is always helpful with anything you need help with.” He further stated “If I need anything which typically isn't very often but if you run across something that we need some assistance on they're always there.”

Members of the office were identified during the discussions as people to call upon based on special circumstances that may arise or have arisen. Sam discussed a case where a body had been buried and stated “the first person I called was Ann.” He went on to say that “everyone else knows any type of shallow grave, call Mary or Ann, that's their expertise.” Nancy also discussed the exhumation and stated that Ann was not on-duty and was working at another job so “they held up the dig until she got off the full time job and went.” Ann identified other coroners as resources in that “Mary is really good to go to if you have something medically that may need an autopsy.” She identified others for their expertise “Sam is good though more along the law enforcement end.” She stated that “Nick is really strong on some other areas.”

Several members identified Nick as a person to go to when dealing with delicate or political issues. In the post interview Nancy discussed calling Nick and receiving his support when pressure was being applied by officials from a neighboring county where a crime was committed, yet the victim died within Esson County. Charles also expressed receiving support from Nick when having difficulty with a local police agency regarding a crime scene. He stated that Nick immediately telephoned the agency’s chief and the issue was immediately resolved. Metro stated “I think he has a lot of good resources and he has a lot of people he can call on too that could come out and help.” Metro stated during the post interview discussion that Nick has made a lot of contacts with politicians and law enforcement leaders which have been helpful. In
the post interview discussion, Ann stated that Nick is a good politician and that has helped in obtaining supplies and the image of the office. Metro also stated that when facing a new problem “Nick has got a great library of books and anytime we have anything specialized he usually has something in that line.” John stated

There's some of the guys, the detectives from the police departments, I have them in my cell phone and I know I can call them anytime day or night, and most of them, at least I know the rapport I have with them being a police officer and working here with them, I know most of them would get out of bed in the middle of the night if I had a problem or answer a question or anything like that. We've already had times where we had been stuck and needed a specific piece of equipment and I would call a detective I know from another department and he would drop what he was doing and bring us this piece of equipment to borrow.

Members demonstrated knowledge of disaster management principles

Several members expressed unfamiliarity with the Esson County Coroner's office disaster plan. Sam replied (whispered) “I have no idea...I have no idea about it.” When Ann was asked if she could discuss the plan she responded, “No I can't. I'm not familiar with it.” Mary responded that “We do have a plan, its, I guess right now in the process of being revised.” Metro stated, “Again, because I am so new at this, I'm not...I haven't been run through any of the scenarios.” When asked whether she was involved with the revisions Mary replied “Nick has been working on it pretty much. I haven't seen the revision. I saw the old plan, which was really antique old, but now since there is new technology with the computers and GPS and all that, I haven't seen the new plan.” When asked whether she was involved with the original plan she replied “No.” Nancy had similar response of the plan when asked and stated “They do and I
probably don't have all the fine details of it.” Charles had a similar response “Well, I don't know if we have one. I'm not really familiar with the disaster plan we have. When Nick was asked about the disaster plan he stated that “well, it basically is an incident command system where you have section chiefs, and from the section chief, they will have deputies and on down. And we try to make it a KISS system with breaking it into the areas of recovery at the scene, then processing through the morgue.”

The lack of knowledge of an organization’s disaster plan is not an unusual event. As stated previously, several members of an outpatient surgery center that I work in periodically did not even know that the building had an individual designated as a disaster officer. Furthermore documentation exists that organizational members did not know the contents of the disaster plan. Kartez and Lindell (1990) argue that members may be unfamiliar with a plan due to the fact that disasters are deemed as unique therefore it is difficult to plan. This similar comment was made by some of the participants in that one can never truly prepare and decisions need to be made based upon the circumstances presented. Another reason that members of an organization are unfamiliar with a disaster plan is the lack of their participation in the development of the plan, as was noted following the Hurricane in Miami in 1992 (Carley and Harrald, 1997). While in this particular case the members had not participated in the plan revision thus far. I still was interested to know whether they really did not understand the principles of disaster management or whether the participants were merely unfamiliar with their individual office plan.

To attempt further inquiry of their knowledge of disaster planning, the participants were asked what they would do if an airplane went down at the airport and the coroner was unavailable. How would they begin their duties? Metro replied, “I would talk with incident command, try to work with them and try to figure out resources, begin to help.”
Sam replied that “What would I do? Go right to the command post. Make sure the command post has been set up. Go to the command post and make sure that supervisors from all the services are there: police, fire and EMS.” Mary responded that “In our disaster plan we have where we can get reefer trucks and call in the dentists and get the people together and then my next thing would be to call in D-Mort. Between you and I, I would probably be calling D-Mort on my way to the scene.” Metro stated, “Probably I would say just a run down sheet, kind of an SOP kind of thing. There is a little book that says when this happens, this is the order of who you call and if you need more resources.” Ann replied to the disaster “I don’t know. Probably a command structure. Like here is the person in charge, the next person in charge… Definitely a command structure, some point of communication, some ability to communication amongst each other.” Nancy replied that “Um, I would call in other counties for support, depending on the amount of people.” John stated, “Obviously the one person that would have to be the overall incident commander would be Nick.” Metro stated, “Again, what I would do is call Nick and the people who were involved with it for a while and take their direction on where to go.” She further expanded and stated “there will be a command center and we’ll play along with them.” When Nick was asked how he felt the others would handle a major disaster in his absence he replied “Here? I think I have a great staff! That part doesn't bother me.” Charles also expressed similar sentiments regarding office preparation “I think the office is well prepared.” John stated, “I think we'd do really well.”

Further responses that indicated knowledge of disaster preparation included Sam mentioning, “I know we get a deal on military body bags at federal surplus a couple years back, and I think we ended up with close to 400 of them that are stock-piled in the basement of our building and if we had some type of mass disaster we can access the bulk storage and get the
body bags.” Mary identified supplies for disasters as well by stating “Well, we got some Tyvek suits.” John also identified the number of military issued body bags in storage. Charles responded that “Obviously refrigerated tractor trailers.”

Following the attacks of 9/11, the federal government re-wrote the National Response Plan which is the parent of the National Incident Management System (NIMS). Within this system three key systems are included: The Incident Command System (ICS) which defines the operating characteristics, interactive management components, and structure of incident management and emergency response organizations engaged throughout the life cycle of an incident; the Multi-agency Coordination Systems which define the operating characteristics, interactive management components, and organizational structure of supporting incident management entities engaged in Federal, State, local, tribal, and regional levels through multi-aid agreements and other assistance arrangements; and the Public Information Systems which refer to processes, procedures, and systems for communicating timely and accurate information to the public during crisis or emergency situations (Pinkson, 2002).

Based upon the answers provided by the participants, they were able to identify several of the concepts that are central to the establishment of a disaster scene. Several of the participants cited the need for an incident command to run the scene. Mary identified the establishment of command for the fire, police and EMS units on the scene. Others were able to identify important support teams such as the DMORT, forensic dentists, refrigeration trucks; others identified neighboring counties for a mutual aid assistance team in the event of a multi-fatality scene.
Implications and Recommendations

Disaster Management

A review of the literature demonstrates that although disaster management is a field that is considered important and talked about widely following a disaster, it is frequently under funded, staffed by ill prepared actors, and quickly forgotten once a disaster has passed (Waugh, 2000). There is no greater recent example than Hurricane Katrina and the devastation of the gulf coast in 2005. Mitigation was not followed as levees were ignored for decades in New Orleans despite warning by various agencies and news outlets. Yet when the disaster did strike, widespread criticism existed towards the various agencies responses, capabilities, and lack of preparation. Other literature (Benjaminov, et al., 2006; Carley and Harrald, 1997) demonstrated a lack of awareness of the response plans by agents directly involved with disaster response due to a lack of input and involvement of the plans.

While within this study, similarities were found when compared with the literature, significant differences were also found. While it was noted by several of the members that they were unaware of their particular office’s disaster plan, it should be noted that the plan was under revision. It also should be noted that the office has participated in several disaster drills at the local airport which is one of the more likely scenarios of a disaster with multiple deaths. It also should be noted that the office has provided financial resources for the members to attend formal training seminars, specifically for disaster management, as several of the members have traveled out of state to attend special seminars. While the specific office plan was an unfamiliar resource, the participants responses indicated their familiarity with disaster management concepts and principles, as established by the National Response Plan, and were aware of the available resources to request assistance from in the event of a disaster.
One recommendation would be for the members to have a more active role in the development of the office’s plan. Sork and Caffarella (1989) posit that direct participation of the participants’ is desirable but not essential. However Carley and Harrald, (1997) found that the lack of participation contributed to a lack of knowledge by the responders following Hurricane Andrew. Not only might participation foster a sense of ownership, based upon their wide variety of experiences, the participants’ may be able to make contributions that the current plan authors had not thought of or experienced.

A second recommendation would be for all of the members to be familiar with the current and developing disaster plan. While the current plan has been called antiquated, it is the current plan if a disaster strikes. Familiarity of the current plan could be accomplished with little effort by providing a written copy to each of the members or by downloading the plan onto a computer drive that is accessible to all of the members. A more desirable method of fostering an awareness of the developing plan is to have the members as active participants in the development of the plan. While this may be desirable, the practicalities of all members being active participants may be limited due to the fact that the office is a 24/7 office and that four of the members are part-time with full-time employment outside of the coroner’s office.

Adult Education

The immense changes in the economic environment caused by globalization and technology have forced organizations from around the world to make significant transformations in order to adapt, survive, and to succeed in the current world. The demands put on organizations now require learning to be delivered faster, cheaper, and more effectively to a fluid workplace and mobile workforce that is more dramatically affected by daily changes in the marketplace than ever before. Organizations continually need new knowledge to survive
(Garvin, 2000). Learning occurs in a variety of settings. Merriam and Caffarella (1999) identify four sites of learning for adults: individual, group, institution, and mass audience. Individual learning is utilitarian in nature, where the focus is on the use of learning as a mechanism for adaptation and survival of the individual (Dixon, 1999). Maier et al. (2001) argue that group learning has implications and similarities for OL. While social aggregates possess more knowledge than individuals do, groups cannot utilize information equally. The lack of utilization may be due to geographical barriers, different job functions, and time factors. Thus, differences exist between small groups and organizations. Merriam and Caffarella (1999) identify the learning organization as one of the new frontiers in learning opportunities for adults.

An LO utilizes methods from the model of organizational learning (OL) as described by Argyris and Schon (1978) as the detection and correction of error. A learning organization is a unit skilled at creating, acquiring and transferring knowledge, as well as modifying its behavior to reflect new knowledge and insights (Garvin, 1993). Senge’s (1990) disciplines of an LO includes personal mastery, mental models, shared vision, team learning, and the glue that maintains the other four disciplines, systems thinking.

The office demonstrated several of these characteristics. While the organization may not have created new knowledge that may be labeled as ground breaking, the members were able to demonstrate the ability of acquiring knowledge and applying the knowledge to real life situations. This was demonstrated by the clay facial reconstructions, of unidentified skeletal remains created by Nick based upon training he received from forensic anthropology courses. Since 9/11, increased concern has developed regarding terrorist attacks with biological agents. Additionally, communicable risks have increased as exampled by international Avian flu epidemics. The participants were able to demonstrate this new knowledge, demonstrate the
transference of the knowledge among the members, and demonstrate modification of behavior, by updated personal protective equipment as well as transportation vehicles that separated the cab of the vehicle from the passenger compartment for the contaminated human remains.

Handy (1995) describes a wheel of learning built on the assumption of competence. This means that each individual can be expected to perform to the limit of his or her capacity, with minimal supervision. Learners within Handy's (1995) model have an “insatiable curiosity” (p.47). This was noted within the office as members were encouraged to develop areas of self interest which would foster self knowledge as well as serve to improve the functioning of the office. This was demonstrated as members cited calling in other members of the office when an area of expertise was needed on a scene.

Further research

While this study is a qualitative case study of a single county coroner’s office, the findings may not represent the functions of other coroner’s offices. Within the Commonwealth of Pennsylvania, 67 coroners’ offices exist. A wide variety exists as to the size, functions, available resources, and annual case volume of each office. While generalizations can not be made to other county coroner offices based upon the results of this one study, the findings can be a stimulus to evaluate other offices to attempt to determine how those particular offices learn and are prepared for disasters. I would be interested to repeat the study with a few other county coroner offices to attempt to determine the similarities and differences of the learning styles of the offices. The results of the additional studies may stimulate the development of a quantitative study of coroner’s offices, at least initially on a state wide level if not national level, of preparedness for disasters, as well as styles used by the office members to learn. While many theories exist regarding organizational learning (Argyris and Schon, 1978; Fiol and Lyles, 1985;
Garvin, 1993, 2000; Handy, 1995; Levitt and March, 1988; Senge, 1990) few empirical studies exist to support the theoretical models. In particular, within this study, single-loop type learning was found to predominate versus double-loop type learning. While organizational learning theorists argue that double loop is a higher form of learning, this study does not support that argument. In fact, my findings suggest that this office functions well with single-loop type learning. This is not to say that the office members are incapable of double-loop type learning, rather the members did demonstrate double loop learning on several occasions.
References


http://www.sfb504.uni-manheimg.de/glossary/orglearn.htm


http://www.gwu.edu/~iodrm/publications/PDF/NSP911


123


Appendix A

Recruitment Script

I’m a doctoral student at Penn State University interested in how people learn. I’m doing research on how you and your colleagues learn to prepare for disasters in. What I’m looking for are volunteers who I can observe during their normal workday, meetings and just your general daily activities. I’d also like interview in two separate interviews, lasting about one hour each. I’ve already received permission from your organization to do this study. Your participation will be totally voluntary and confidentiality will be strictly enforced.

If you agree to participate you’ll be asked to sign an informed consent form that explains your role. You can, of course, withdraw from the study at any time.
Appendix B

Iteration #1

1) Tell me a little bit about yourself. Your background, education how you got your position
   Keys: formal education, training, training outside the job, employment history, including reasons for change in job/position

2) Take me to what you consider to be a “typical” day at work.
   Keys: Focus on detailed description; focus on what, not why, of work; follow-up on: specific examples of likes, onerous tasks, etc

3) Okay, as you know, I’m interested in disaster management. I know your office has a disaster plan? As far as you know, what’s in the plan?
   Keys: Follow-up with how was plan written – especially process for writing, who consulted when written, when modified, etc. what was your involvement, how often do you personally consult the plan, what is especially useful

4) Tell me about a specific incident that you would call a disaster. Then tell me what you did and what you thought your role was?
   Keys: Focus on description; ask relationship to disaster plan; follow up on how they knew what to do (explore in detail)

5) You mentioned earlier about the various education and training you received. How did that training help (if it did) in responding to the disaster?
   Keys: Specific, focus on what aspects of training did/didn’t work; focus on informal learning from coworkers etc.

6) What’s missing from your training? What do you think you like to know that would help you in dealing with disasters?
   Keys: Focus on informal learning from colleagues; go into details.

Iteration #2

1) Can you tell me a bit about your interactions with coworkers?
   Keys: when meet, what they talk about, formal/informal sessions

2) What’s your personal relationship with individuals that work with agencies you cooperate with – like police, fire, and physicians?
   Keys: specifics, both formal and informal, ask about mutual training, stay alert to points of disagreement, overlapping roles etc.
3) How prepared do you think the office is to deal with a major disaster like .... (ask for examples)? How does the plan help or doesn’t help?
   Keys: focus on learning aspect; what have they learned how have they learned

4) If you were to design a disaster management plan, what would be the crucial elements?
   Key: Stimulate response by highlighting key elements of present plan; ask what they would change.
Appendix C

BR: How many did the landfill morgue hold?

N: Well, actually it held pieces.

BR: Pieces?

N: In trailers, yes. But thousands of pieces had been recovered. Now they didn't do studies and DNA on all of them.

BR: But what did they do with the mass pieces, did they do a cremation eventually? Or Burial?

N: I don't know. I know they tagged everything, so it's cataloged, but I don't know what they've done with it.

BR: That's very interesting. I never got called but I signed up that night on September 11, I think it was with PEMA, and I either even had the option of going to DC or going to New York. I said I'll go either one, but I'd rather go to DC, at least I won't have to walk home. New York I knew that would be possible depending on what happened.

N: We stayed at the firehouse.

BR: Oh. I know we talked a little about training. If you have specific training in regards to disasters, I mean I know you've written the draft for the policy, but have you attended formal training?

N: I have, I just completed some training on the incident command system.

BR: Where was that?

N: That was state mandated, so I went to that and that sort of thing, but most of it has been, getting from other larger municipalities, their system and saying how would we handle it.

BR: What systems have you looked at?

N: I think we looked at LA, Oklahoma, wherever disasters were. I'd have to go back over the list and see what we looked at. Most of them were planes; of course Oklahoma was the federal building. Exploration

BR: Have you communicated much with people from those offices or not? Or is it more just reviewing their plans?

N: Just initially and from each one of them we sort of got, "well we sort of have the plans on the shelf but we never got them down, we just went with it" and I know, and he
### Planning

<table>
<thead>
<tr>
<th><strong>Question</strong></th>
<th><strong>Response</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Go right to the command post. Make sure the command post has been set up. Go to the command post and make sure that supervisors from all the services are there: police, fire and EMS.</td>
<td>MM 384</td>
</tr>
<tr>
<td>I don't know. I'd say a dozen or so we could probably handle up to 20-30 people</td>
<td>MM 398</td>
</tr>
<tr>
<td>I think we ended up with close to 400 of them that are stock-piled in the basement of our building and if we had some type of mass disaster we can access the bulk storage and get the body bags</td>
<td>MM 417</td>
</tr>
<tr>
<td>I think really we might be able to, if we had a disaster with maybe up to 20, minus we can handle it. But I truly think that anything over 20 we just couldn't do it.</td>
<td>MM 449</td>
</tr>
<tr>
<td>We do have a plan, is I guess right now in the process of being revised</td>
<td>PG 103</td>
</tr>
<tr>
<td>No, I can't.</td>
<td>PG 107</td>
</tr>
<tr>
<td>I would say more than a dozen it wasn't considered a disaster.</td>
<td>PG 127</td>
</tr>
<tr>
<td>I think pretty good Probably a command structure</td>
<td>LP 116</td>
</tr>
<tr>
<td>Well, it basically is an incident command system where you have section chiefs, and from the section chief, they will have deputies and on down. And</td>
<td>LP 139</td>
</tr>
<tr>
<td></td>
<td>LP 142</td>
</tr>
<tr>
<td></td>
<td>LP 358</td>
</tr>
<tr>
<td></td>
<td>LP 374</td>
</tr>
<tr>
<td></td>
<td>GH 80</td>
</tr>
</tbody>
</table>
Appendix E

Informed Consent Form for Social Science Research
The Pennsylvania State University

Title of Project: Organizational Learning and Disaster Management in a County Coroner’s Office:
A Case Study.

Principal Investigator: Bruce S. Rudy
P.O. Box 850 HO89
500 University Drive
Hershey, PA 17033
brudy@psu.edu
717-531-4720

Advisor: Dr. Fred M. Schied
The Pennsylvania State University
Department of Learning and Performance Systems
Adult Education Program
314 Keller Building
University Park, PA 16802
fms3@psu.edu
814-863-3499

1. Purpose of the Study: The purpose of this research is to explore how members of a county coroner’s office
learn to prepare for disaster management.

2. Procedures to be followed: Audio taping is a part of this research. You will be asked to be tape recorded
during conversations and be observed during the normal course of a work day, during meetings, and during
discussions with co-workers.

3. Discomforts and Risks: There are no risks in participating in this research beyond those experienced in
everyday life. Some of the questions are personal and might cause discomfort.

4. Benefits: You might learn more about yourself by participating in this study. You might have a better
understanding of how learning occurs within your organization. You might realize that others have had
similar experiences as you have.

This research might provide a better understanding of how coroners learn to prepare for disasters. This
information could help plan programs and make coroners better prepared to manage disasters.

5. Duration/Time: The interviews will last approximately one hour. A second interview may be requested for
clarification purposes of comments from the initial interview. Observations will occur in the natural setting
of your work day.

6. Statement of Confidentiality: Your participation in this research is confidential. Only the principal
investigator will know your identity. The tapes, master list linked to code names, and data will be stored and
secured at my office at the Hershey Medical Center in a locked file. No other individual will have a key to the
locked cabinet. The tapes, master list, and data will be destroyed after three years. The following may review
and copy records related to this research: The Office of Human Research Protections in the U.S. Department of
Appendix E

Health and Human Services, Penn State University's Social Science Institutional Review Board, and Penn State University's Office for Research Protections. In the event of a publication or presentation resulting from the research, no personally identifiable information will be shared.

7. **Right to Ask Questions**: Please contact ___Bruce S. Rudy___ at (717) 531-4720 with questions or concerns about this study. You can also call this number if you have complaints or concerns about this research. If you have questions about your rights as a research participant, or you have concerns or general questions about the research, contact Penn State University's Office for Research Protections at (814) 865-1775. You may also call this number if you cannot reach the research team or wish to talk to someone else.

8. **Voluntary Participation**: Your decision to be in this research is voluntary. You can stop at any time. You do not have to answer any questions you do not want to answer. Refusal to take part in or withdrawing from this study will involve no penalty or loss of benefits you would receive otherwise.

You must be 18 years of age or older to consent to take part in this research study. If you agree to take part in this research study and the information outlined above, please sign your name and indicate the date below.

☐ I give my permission to be audio taped.

☐ I do not give my permission to be audio taped.

You will be given a copy of this form for your records.

_____________________________  _________________________
Participant Signature                                Date

_____________________________
Person Obtaining Consent

_____________________________
Date
Curriculum Vita

Bruce S. Rudy

Education

D.Ed. The Pennsylvania State University 2007
P.A. Albany Medial College 1989
M.S. Mansfield University 1986
B.S. East Stroudsburg University 1984

Professional Experience

Physician Assistant
Hershey Medical Center- Hershey, PA 1992-Present
Pennsylvania College of Technology- Williamsport, PA 1999-2003
Ellis Hospital- Schenectady, NY 1989-1992

Athletic Trainer
St. Joseph’s Hospital Elmira, NY 1985-1987

Deputy Coroner
Lebanon County- Lebanon PA 1995-Present

Publications


Presentations